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Automaticity and Achievement Goals:

A Theoretical and Empirical Exploration of the
Implications of Research on the Implicit for Capturing
Students' Goals for Studying

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Submitted in partial fulfilment of the qualification of

Doctorate of Philosophy in Education

School of Education, Durham University

February 2015

Abstract

This thesis examines whether implications from research in the field of implicit cognition apply to achievement goals via firstly an extensive re-assessment of the literature (Chapters 2 and 3) and then via a series of experiments (Chapters 4-7).

Chapter one introduces the work, and outlines the rationale, aims and research. Chapter two is a critical examination of how achievement goals are currently defined and operationalized, and highlights the underlying assumptions that achievement goals are conscious and accessible. Chapter three challenges these assumptions by examining the literature on implicit cognition and nonconscious goal pursuit. Chapter three argues that as cognitive representations, there is a potential for achievement goals to be activated and operate nonconsciously, and that a methodology predominantly based on self-report is limited in the access it may provide to achievement goals.

Chapter four designs, tests, and compares two original achievement goal implicit methods, the Valence IAT and Self/Other Referent IAT, with the Achievement Goal Questionnaire-*Revised* (AGQ-R, Elliot & Murayama, 2008), and found good internal consistency for both IATs but no significant correlations between IATs and AGQ-R. Chapter five compares the Valence IAT and the AGQ-R with students' persistence behavior on an achievement task, and found both methods to be equally consistent with behavior. Chapter six tests whether achievement goals can be primed to influence subsequent achievement behavior, and found that persistence behavior differed significantly by priming condition in line with theorized patterns for performance and mastery goals. In Chapter seven, achievement goals are primed and compared directly with the Valence IAT and the AGQ-R, and both methods were found to be equally consistent with the primed goal.

Chapter eight summarizes and concludes that this thesis provides the first in-depth theoretical and methodological exploration of the potential for nonconscious achievement goals in what is a promising field for continued study.

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List of Abbreviations

IAT – Implicit Association Test

AGQ – Achievement Goal Questionnaire

AGQ-R – Achievement Goal Questionnaire-*Revised*

PhD – Doctor of Philosophy

TARGET – Tasks, Authority, Recognition, Grouping, Evaluation, and Time

TAT – Thematic Apperception Test

n Ach – Need for Achievement

n Aff – Need for Affiliation

n Dom – Need for Dominance

n Auto – Need for Autonomy

$f_{p, -Fai}$ – Force on the Person Away from Failure

$f_{p, Suc}$ – Force on the Person Toward Success

M_s – Motive for Success

M_{AF} – Motive to Avoid Failure

P_s – Probability of Success

P_f – Probability of Failure

I_s – Incentive Value of Success

$-I_f$ – Incentive Value of Failure

TAQ – Task Anxiety Questionnaire

PDP – Parallel Distributed Processing

PALS – Patterns of Adaptive Learning Scales

IRAP – Implicit Relational Assessment Procedure

EEG – Electroencephalography

EMG – Electromyography

ACT – Adaptive Control of Thought

PSEs – Picture Story Exercises

RFT – Relational Frame Theory

REP – Relational Evaluation Procedure

IAT-T – Implicit Association Test-Type Measure

PAP – Performance Approach

PAV – Performance Avoidance

MAP – Mastery Approach

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MAV – Mastery Avoidance

P_Avg – Average of Performance Approach and Avoidance

M_Avg – Average of Mastery Approach and Avoidance

PANAS – Positive and Negative Affect Schedule

IMI – Intrinsic Motivation Inventory

ANOVA – Analysis of Variance

Declaration

Some of the contents of the literature review in this thesis formed part of my dissertation for MA Research Methods in Education (Durham University, 2010). A later version of the literature review was then adapted into a theoretical article (da Costa & Remedios, 2014) for the Journal of Mixed Methods Research, a copy of which can be found in Appendix 10.5.

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Acknowledgments

The irony of motivating oneself to write a motivation thesis! I would like to express my sincerest gratitude to those who have helped me along the way, from my fellow PhD students to every last participant who generously gave of their time. Martin Richardson, you opened the doors of this university to me, and I never thought they would lead me here, almost ten years later. Richard Remedios, not only did you put the idea of a PhD in my head in the first place, you saw it to fruition! Thank you for always being so calm, for pushing me, and for believing I could do this when I could not believe it myself. Joe Elliott, thank you for keeping an eye out for me all these years. Emma Mercier, thank you for showing me that I could be an educational researcher. Steve Higgins and Dave Putwain, thank you for an incredibly thought-provoking viva and important suggestions for improvement. Papa and Mama, you have always said, “all you can do is try your best.” Thank you for your loving support. Alex, Bettina, Simone, and Inês, hopefully we can now change BPL to PhD. And finally, Nathan Stephens-Griffin, thank you for constantly inspiring me.

Dedication

This thesis is dedicated to Aleixo Manuel da Costa: not only my dear grandfather and Curator of the Biblioteca Nacional Vasco da Gama, but also the most impressive and painstakingly methodical researcher I have come across.

“A natureza produz, mas a educação melhora.” - Tomás Ribeiro¹

¹ in Gracias, 1909, p. 131.

² Although there is evidence of using achievement goal findings to inform pedagogical practice, there have been relatively few attempts to do so. Elliot and Murayama (2008) have suggested that this may be linked to a lack of correspondence between the articulation of goal concepts, operationalization, and testing, resulting in “interpretational ambiguity [which]...undermines attempts to transfer information gleaned from research to real-world achievement settings” (p. 613).

Preface

Organization of the PhD

This PhD is split into 7 chapters. The first chapter is an introduction to the study of motivation and why it should be studied within educational contexts, highlighting the significance of the research carried out in this thesis and its contribution to knowledge. The second chapter provides a background to the theory and measurement of achievement goals, critically considering a series of definitional and methodological issues. Chapter three, *A Case for Nonconscious Achievement Goals*, presents the empirical support for the claim that individuals pursue goals nonconsciously (c.f. consciously), assesses the implications of nonconscious goal pursuit for achievement goal theory, and considers possible methods for exploring whether achievement goals can be examined at the nonconscious level.

The next four chapters report empirical investigations conducted for this thesis of studies that examine implicit and explicit methods for studying achievement goals. Chapter four describes and discusses the design, development, and administration of two original achievement goal Implicit Association Tests (IATs, Greenwald, McGhee, & Schwartz, 1998), including a comparison of IAT scores with the participants' self-reported achievement goals (Study 1). Chapter five reports a second study wherein participants' persistence behavior on an achievement task was compared with their responses to either an explicit or an implicit method (Study 2). Chapter six documents a study in which the potential for nonconscious achievement goals is tested using a priming paradigm and persistence behavior on an achievement task (Study 3). Chapter seven then describes a fourth study in which achievement goals were again primed, but then compared directly with explicit and implicit methods (Study 4).

The final chapter comprises a discussion and conclusion to the thesis, offering suggestions for changes to how achievement goals can be defined and captured, as well as future directions for scholarship in the exploration of implicit and explicit aspects of achievement goals.

Introduction

Achievement goal theory is one of the most popular and widely researched theories of academic motivation. The theory argues that students' achievement behavior is directed by the cognitive goals they choose in achievement settings. However, in recent years, research findings on implicit cognition have highlighted and challenged achievement goal theorists' key assumptions regarding the consciousness and accessibility of achievement goals (da Costa & Remedios, 2014; see Appendix 10.5). This thesis is an attempt to assess the extent of this challenge, and to understand both theoretically and empirically whether the implications of implicit cognition research apply to achievement goals.

In establishing the need for and significance of this endeavor, three initial questions are posed:

1. *Why should we undertake research on achievement motivation?*
2. *Why should we undertake pure basic research on achievement motivation?*
3. *Why should we undertake pure basic research on achievement motivation and conscious awareness?*

1.1 Why should we undertake research on achievement motivation?

Answering the logical first 'why' question, *why we should undertake research on achievement motivation*, requires a short deconstruction of what is meant by the term *achievement motivation*. Motivation itself can be understood as "the physiological process involved in the direction, vigour, and persistence of behaviour" (Bergin, Ford, & Hess, 1993, p. 437). The 'direction' of this behavior implies ends, or goals, while 'vigour' and 'persistence' are descriptions of the nature of the behavior directed at these goals. The study of achievement motivation, in the vein of research by McClelland, Atkinson and colleagues (Atkinson, 1957; McClelland, Atkinson, Clark & Lowell, 1953), is concerned with why individuals behave as they do when presented with opportunities to achieve, looking specifically at their need for achievement and fear of failure as motives. Achievement goal theory is a later theoretical development that is

focused on achievement and specifically, competence, in academic settings. The work originated in studies in the late 1970's and early 1980's e.g. Diener and Dweck (1978, 1980), Dweck (1986), Dweck and Elliott (1983), Dweck and Leggett (1988), Maehr and Nicholls (1980), and Nicholls (1975, 1978, 1984), that examined children's attributional responses to failures in achievement. Achievement goals have been defined as "a cognitive representation of a future object that the organism is committed to approach or avoid" (Elliot & Fryer, 2008, p. 244; for more details, see Chapter 2). At the heart of goal theory lie the complex interactions between the choice of behavior to which one is directed (i.e., the achievement goal), and differences in learning and achievement.

1.1.1 Ethical Rationale

According to Nicholls (1978), one of the main rationales for studying achievement goals is an ethical one: to help children have an equal opportunity to succeed. In other words, achievement goal research should be conducted to address the inequalities inherent in the far from ideal world of the classroom. While all students in a classroom might be presented with the same lessons and similar treatment by way of encouragement to achieve from their teacher, how they affectively, cognitively, and behaviorally respond to these materials and the teacher-student relationship may differ, and can lead to the academic success of some and the failure of others. As such, if a student's motivation impacts on their academic success and subsequent life opportunities, educational research and teaching need to ensure that students have access to equal opportunities in terms of the motivational patterns required for success (Nicholls, 1978). If researchers can systematically identify those motivational patterns that consistently characterise a relationship to maladaptive learning outcomes, affect and achievement, they can try to understand and intervene to help children who are stuck within these patterns.

For example, the exploration of learned helplessness in terms of achievement (Diener & Dweck, 1978, 1980; see also Seligman & Maier, 1967), or "the perceived inability to surmount failure" (Diener & Dweck, 1978, p. 451), has sought to provide information on the classroom practices and emotions, beliefs about ability, and learning behaviors that often accompany students' avoidance

of challenges, poor performance, and lack of persistence in the face of difficulty. Acknowledging that difficulty and failure are a part of life, and that all students deserve to develop processes for dealing with this adaptively, Dweck and her colleagues (Dweck, 1975; Blackwell, Trzesniewski, & Dweck, 2007, see Dweck & Master, 2009, for a review) have investigated redressing students' beliefs about their achievement-related successes and failures within the effort-ability framework of attribution theory (Weiner, 1986, 1995). In attribution retraining (Dweck, 1975), where students learn how to adopt incremental rather than entity theories regarding the respective mutable versus fixed nature of their intelligence and ability, failure is presented as a function of effort, a dynamic factor that can be increased to obtain future success. The likelihood of success is thereby transformed into something achievable, and students are likely to be more motivated to keep trying, as evidenced in Blackwell, Trzesniewski, & Dweck's (2007) finding that experimental group participants' motivation and maths achievement improved compared to that of students in a comparison group. Likewise, helping students develop the ability to deal adaptively with failure ensures that students initially take the chances that might ultimately lead to success.

Attributions and beliefs about the self as a learner, or self-theories (Dweck & Leggett, 1988), even in the absence of actual differential achievement, interact with motivation and affect behavior both within the classroom and in later life. A striking example is evident in a recent study of math-gender stereotypes in elementary school children, in which Cvencek, Meltzoff, and Greenwald (2011) emphasise children's "reduced interest in future academic courses and occupations that are incompatible with their academic self-concept" (p. 767). This suggests serious motivational consequences that can bleed into eventual life choices when, as early as in the second grade, girls are even unwittingly exposed to a math-boy stereotype incongruent with their identification as females. Ensuring equal motivational opportunity to achieve thus also requires that we deconstruct the forces underlying students' motivational decisions and behaviors and address such features of a hidden curriculum (Jackson, 1968).

1.1.2 Pedagogical Rationale

In addition to the ethical rationale, research on achievement motivation can provide helpful pedagogical insights. For example, within the literature on school reform, Anderman (1997) has made a case for the application of achievement motivation research findings to the development of motivationally adaptive classroom materials and practices, teacher behaviors, school management policies, and even reform at the level of the nation. The logic behind this reform is based more on addressing the achievement setting rather than the individual student as a starting point: if education professionals ensure not only classroom but whole school learning environments are as conducive as possible to stimulating adaptive motivational behaviors, it is assumed this will elicit these behaviors from students. As part of this, achievement motivation research findings could be used to provide examples of classroom goal structures that replace emphasis on peer comparisons with personal improvement (e.g., Anderman & Young, 1994), or external rewards for learning with examples of how lessons relate and may be relevant to students' lives (e.g., Meece, 1991).

Work in both elementary and middle schools (Ames, 1990; Maehr & Midgley, 1996) in the US has provided examples of occasions on which change in schools has been based on achievement goal orientation research. Ames's (1990, 1992) work with the TARGET framework first introduced by Epstein (1989) has focused on how changes to traditional teaching methods in the areas of tasks, authority, recognition, grouping, evaluation and time can improve student motivation. Ames (1990) found that students who had experienced this system used more appropriate learning strategies and held better attitudes to maths than their control group peers. More recently, Lueftenegger, van de Schoot, Schober and colleagues (2014) completed a longitudinal study of TARGET in a secondary school population, and found a positive impact on student mastery goal orientations. Maehr and Midgley (1996) also spent three years working on the Coalition Project in an elementary and a middle school with teams comprising school staff, teachers, and parents, devising means of applying goal orientation research to school policies. They found that changing the school culture in terms of better alignment with a mastery goal focus had a positive

impact on student motivation in both the elementary and middle school, such that students exhibited “more motivationally adaptive goal orientations, higher levels of academic efficacy, and more positive perceptions of the classroom goal structure than did students at a comparison middle school” (Anderman, 1997, p. 329, but see also Anderman, Maehr, & Midgley, 1999).

Thus there is evidence that studying achievement motivation can have direct effects on improvements in pedagogical practices that are intended to indirectly improve students’ motivational patterns.² While the latter may not be guaranteed, Anderman and Anderman (1999) and Urdan and Midgley (2003) have indicated that incorporating achievement motivation research into teacher practices and school policies can improve the likelihood that students themselves endorse and pursue more positive motivational patterns.

1.1.3 Philosophical Rationale

It is not only important to study achievement motivation with the goal of *motivating* in terms of addressing maladaptive motivational patterns, revising school policies and teaching methods, or tackling the forces that disproportionately affect students’ motivation to achieve. It is also important to study achievement motivation with the goal of better understanding *how* motivation works; breaking achievement motivation constructs down into their component parts and exploring their structure and operation. This difference between *motivating* and *motivation* represents the same distinction made by Crutchfield (1992, p. 68) between engineers and scientists in their respective searches for knowledge. While an engineer needs to know *what* works, scientists strive for understanding the underlying mechanisms, the *why* and *how* of how things work.

² Although there is evidence of using achievement goal findings to inform pedagogical practice, there have been relatively few attempts to do so. Elliot and Murayama (2008) have suggested that this may be linked to a lack of correspondence between the articulation of goal concepts, operationalization, and testing, resulting in “interpretational ambiguity [which]...undermines attempts to transfer information gleaned from research to real-world achievement settings” (p. 613).

Pintrich (2003) outlines the need for a concerted effort to conduct systematic research on motivating *and* motivation using Stokes's (1997) visual conceptualization of research goals into quadrants (see Table 1 below). Pintrich locates motivational research at the intersection between Pasteur's quadrant of *use-inspired basic research* and Bohr's quadrant of *pure basic research*, arguing that a meaningful, holistic understanding of motivation requires scientists to work in both of these quadrants. While the former works towards the goals of both scientific understanding and practical utility, Bohr's quadrant, characterised by research into physiological mechanisms and the role of basic motives and unconscious processes, has the primary goal of scientific understanding.

Table 1. Different types of research in motivational science

Research Goal	Pure basic research (Bohr's quadrant)	Use-inspired basic research (Pasteur's quadrant)	Unlabeled	Pure applied research (Edison's quadrant)
Goal–Scientific Understanding	High	High	Low	Low
Goal–Practical Utility	Low	High	Low	High
Research Examples	Research on physiological mechanisms of motivation; role of basic motives and unconscious processes	Theory-driven design or intervention studies; longitudinal, developmental studies of role of motivational constructs in context	Research undertaken for a class to learn research skills	Testing and developing interventions, technologies, curricula to foster student motivation

Note. Adapted from Pintrich (2003, p. 669).

Much research on achievement motivation, including that covered in the previous section on pedagogical rationale, reflects the concerns of Pasteur's quadrant. Such concerns are both considerable and reasonable, especially given the pressure educational researchers may experience to produce research that directly improves students' motivation, at least in the short term, and

realistically, that consequently improves student attainment. However, the associated opportunity cost may be obtaining a more integrated understanding of the actual mental representation and functioning of achievement goals. Though the worth of use-inspired basic research on achievement motivation seems obvious – it can be used to directly help students improve their motivational responses and behaviors – the merits of pure basic research on achievement motivation may not appear as obvious.

1.2 Why should we undertake pure basic research on achievement motivation?

The second ‘why’ question is, *why should we undertake pure basic research in achievement motivation?*

1.2.1 The Advancement of Theory through Bohr’s Quadrant

One reason is that the provided examples of research in Pasteur’s quadrant include interventions that are ‘theory-driven’. Logically, such interventions require theory generation and represent a means of theory testing. Pure basic research is represented both by the stage at which theories are generated and at which, having been tested and found to be problematic either through consistently conflicting empirical findings or logical, reasoned argument, theories undergo revision before further testing. Not only, then, is pure basic research necessary for maintaining the figurative health of theoretical constructs; it also goes hand in hand with research conducted in Pasteur’s quadrant, by providing the clear theoretical bases for intervention and ultimately, improvement.

Recent debates in achievement goal research have surrounded conflicting findings of whether the endorsement of one type of achievement goals, *performance goals*, is adaptive or maladaptive. As conflicting findings make it difficult to translate research findings into recommendations for practical application, researchers have paused to explore why such divergent findings have emerged. One attempt to understand conflicting findings has targeted the different ways goals have been operationalized. Operationalization is the

process through which a construct is translated into something measurable (Trochim, 2006). This process is vital because how a construct is defined impacts on the questions that can be asked about it, what is found, and how that research is assessed. Questioning achievement goal researchers' operational definitions has highlighted fundamental and crucial differences in the assumptions made about performance goals amongst achievement goal researchers, and thrown up several compelling conclusions. In this way, this pause has provided a chance to re-examine the theoretical underpinnings of the achievement goal construct, a task falling under the remit of Bohr's quadrant. This thesis takes the critique further, by questioning the ontological and epistemological context in which goal theory assumptions are made.

1.2.2 'Context' in Pasteur's Quadrant

Another reason that pure basic research in achievement motivation should be undertaken is that Pasteur's quadrant is described as involving studies of motivational constructs in 'context'. Logically, this assumes that achievement motivation can also be studied without 'context', or objectively. This reading is undergirded by a weight of ontological assumption and suggests that achievement motivation does not exist solely as a socially constructed concept. It is not just a powerful tool for understanding our lives in the sense of the Thomas theorem, that if men define situations as real, they are real in their consequences (1928). Instead, achievement goals may be understood as reified constructs. They may represent a reality external to our perception and understanding of it, with causal antecedents and effects. This line of argument is firmly anchored in Bhaskar's (1978) three levels of critical or depth realism. According to Bhaskar, ontological reality has depth, with different epistemological levels. Thus, there are different extents of being able to know and access reality. The *real* layer is the deepest, and is that of the generative processes, which exist, but cannot be known directly, only inferred. The second deepest is the *actual* layer, which is that of the events that may or may not be perceived by observers. The third, *empirical*, layer is that on which events are experienced through the senses. When applied to achievement goal theory, conflation of these layers can hide the crucial distinction between, on the real level, the working of motivational processes, on the actual level, the mental

representation of achievement goals, and on the empirical level, their availability to human consciousness (and nested within this latter, human understanding of causality as regards motivation and achievement). The question that remains thus is *how should we go about trying to capture students' achievement goals?*

Using pure basic research to shed light on current operationalizations of achievement goals actually raises a series of serious issues not only regarding the methods used to capture goals and how goals are operationalized in these methods, but also about the context of assumptions underlying this process. Unpicking these assumptions and exposing them to critique generated by research findings in different fields forms part of the process of pausing to take stock of where achievement goal theory is right now, thirty years since its beginnings, and by addressing these issues and opening up a debate regarding them, betters the chance that goal theory will emerge a stronger, more application-relevant theory in the decades to come.

1.3 Why should we undertake pure basic research on achievement motivation and conscious awareness?

This leads to the third 'why' question posed in this thesis, *why should we undertake pure basic research on the interactions between achievement motivation and conscious awareness?* Though an individual's thoughts, beliefs and behaviors all occur to some extent on a conscious level,³ allowing for the possibility of some self-report, the extent to which this is the case with their goals is not so clear. Taking stock of the field of achievement motivation research in 2003, Pintrich asked seven substantive questions. One of these questions was *do*

³ In terms of the unconscious level, an example of an unconscious belief could be an implicitly held stereotype regarding race, as in the research of Greenwald, Nosek and Banaji (1998). An example of an unconscious behavior could be that which is triggered by a nonconsciously activated trait such as competitiveness, as in the research of Kawada, Oettingen, Gollwitzer, and Bargh (2004). The unconscious level of a thought, however, lies in the generation of that thought, rather than its appearance in the conscious mind. So, for example, an unconscious thought could be the result of a nonconscious process, as is observed with 'mystery moods' in the research of Chartrand and Bargh (2002). For further discussion on the unconscious, see Chapter 3.

students know what they want or what motivates them? According to Pintrich, the question refers to the “many occasions when motivation and learning, in the classroom and in life in general, are not so conscious, intentional, and self-regulating” (2003, p. 678) as current models of motivation and self-regulation might assume. He pointed at a range of research literatures, such as that on implicit cognition and nonconscious goal pursuit, which have produced findings that challenge assumptions of conscious awareness and control. While these fields already grapple with issues surrounding intentionality, the implications of their findings for achievement goal theory have largely been left unaddressed.

It is unlikely that the entirety of the current achievement goal model will require revision. Instead, Pintrich (2003, p. 678) suggests that largely explicit models of self-regulation and motivation must be amended but that this need not necessarily mean switching to entirely implicit models. Instead, models of achievement goals that emerge from evidence provided by reasoned argument and empirical investigation will most likely integrate explicit and implicit aspects. And yet, ten years have passed since Pintrich’s question was posed, and relatively little attention has been paid to pure basic research on conscious awareness in achievement goal research. It is an important time for the field to consider the findings of such research and assess the extent to which they apply to achievement goal models - to fail to do so for much longer would indicate an unwillingness to address these potential challenges to the robust measurement of achievement goals.

Within this context, the following thesis envisions a series of tasks ahead of achievement goal theory, and seeks to address them in turn. The first task is to achieve a better, more critical understanding of how current methods operationalize achievement goals. This will be done through exploring and critiquing how current methods employed in achievement goal theory such as experiments, questionnaires, and interviews purport to capture achievement goals. Recognizing that the changing definition of achievement goals occurs through differences in operationalization, the thesis will examine the assumptions of consciousness and accessibility underlying these operational definitions.

The second task is to incorporate what the findings from research on implicit cognition and nonconscious goal pursuit are and what they imply for achievement goal theory and research. This will be done by presenting the findings of theoretical and empirical work on telling more than we can know (Nisbett & Wilson, 1977), the illusion of conscious will (Wegner, 2002; Wegner & Wheatley, 1999), limits to conscious self-regulatory capacity (Baumeister, Bratslavsky, Muraven, & Tice, 1998), automaticity and nonconscious goal pursuit (Bargh, 1990; Bargh & Chartrand, 1999), and the concepts of the cognitive unconscious and the new unconscious described by Kihlstrom (1987) and Hassin, Uleman and Bargh (2005), respectively. Once these findings have been set out, an assessment will be made of the extent to which their implications are applicable to achievement goals, and whether an argument can be made for nonconscious achievement goals.

The third task represents a move from reasoned argument to empirical studies: from how these implications should theoretically apply to achievement goals as they are currently theorized to a series of studies from which it might be possible to infer a model of how achievement goals are mentally represented in terms of degrees of conscious awareness. The first such study describes the design and administration of an implicit method for assessing achievement goals, followed by a comparison of whether this method indicates anything different or additional to a more commonly used self-report method (Study 1). The second study then expands on the first; it compares participants' responses to either the implicit or explicit method with their behavior on an achievement task (Study 2). The third study explores whether it is possible to nonconsciously activate achievement goals, such that the priming might elicit goal-consistent behavior on a subsequent achievement task in the absence of conscious awareness (Study 3). In the fourth and final exploratory study, nonconscious activation of achievement goals is compared with participants' responses to either the implicit or explicit method (Study 4).

From the reasoned argument and these empirical studies, the fourth task is finally to suggest the extent to which researchers studying achievement goals should seriously consider the implicit, and which methods this thesis has found

to be the most appropriate for doing so in future research on students' achievement goals.

1.4 Aims and Objectives

The primary aim of the current research is thus to explore the nature and methodological implications of the possibility for nonconscious *achievement goal* pursuit. The guiding objectives are to:

1. *Understand current operationalizations of achievement goals and the assumptions underlying them* (Chapter 2);
2. *Examine the literature on implicit cognition and nonconscious goal pursuit and identify the key implications of these literatures for the definition and operationalization of achievement goals* (Chapter 3);
3. *Assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through*
 - a. *reasoned argument* (Chapter 3);
 - b. *designing and running a series of studies to empirically test if achievement goals can operate and be captured without conscious awareness by:*
 - i) *developing an implicit method to access achievement goals and comparing it with an explicit achievement goal method* (Chapter 4)
 - ii) *conducting a comparison between achievement behavior and implicit and explicit achievement goal methods* (Chapter 5)
 - iii) *exploring if achievement goals can be nonconsciously activated (primed) and subsequently influence achievement behavior* (Chapter 6)
 - iv) *conducting a comparison between nonconscious activation and implicit and explicit achievement goal methods* (Chapter 7)
4. *Finally, to suggest any potential changes to the model of achievement goals based on the arguments and findings resulting from the previous aims* (Chapter 8).

1.5 Research questions

The overall question guiding the thesis is *to what extent do the implications from research on implicit cognition impact on how achievement goals are currently and could possibly be captured?* Ultimately, this question could also be phrased as *is there a possibility that achievement goals can be pursued nonconsciously, and if so, what does this imply for how we theorize and capture them?* This then breaks down into a question corresponding to each of the aforementioned aims of the thesis:

1. *What are the operational definitions of achievement goals as evidenced by current methods employed to capture students' goals for studying? What are the assumptions regarding consciousness and accessibility underlying achievement goal methods? How explicit are these assumptions and how are they addressed in the field?*
2. *What are the key findings from the various literatures on implicit cognition and what are their methodological implications?*
3. *Are the implications of research on implicit cognition applicable to achievement goal theory?*
4. *Given the implications of research on implicit cognition, and a reasoned argument and evidence from a series of empirical studies on their applicability to achievement goals, are there any changes that might need to be made to how achievement goals are theorized and the methods used to capture them?*

1.6 Original Contributions & Significance of the Research

1.6.1 Addressing the Potential Importance of the Implicit for Achievement Goals

This thesis presents the first theoretical and methodological attempt at investigating the potential importance of the implicit for achievement goal theory. The implications of research on implicit cognition, especially where limited introspective ability or nonconscious goals detract from an individual's ability to accurately self-report, have already received much attention where goals in general rather than achievement goals specifically are concerned. Given the prominence of achievement goal theory and its potential to improve

educational practice, however, in addition to current methodological issues regarding conflicting findings, it is time that these implications are considered so that the field can decide their lack of applicability or address them directly, both theoretically and methodologically. The thesis aims to make this contribution.

1.6.2 Methodological Contributions: Nonconscious Activation, Behavioral Aspects, and an Implicit Method

Also, that empirical studies are carried out, in addition to a theoretical argument, provides further contributions. The first contribution is in providing an indication of whether nonconscious activation, or priming, procedures work with achievement goals in the same way as they have been shown to work with other behavioral, cognitive, and even achievement-related goals.⁴ The second is the rare examination of a variety of achievement goal methods – behavioral, self-reported, and implicit, which supersedes the current largely questionnaire-based corpus of achievement goal research. The third contribution is the design, development, and administration of two versions of an original implicit method for capturing achievement goals, which may undergo replications, further validation procedures, and possibly be used in future research elucidating why, how and in what situations achievement goal pursuit may be conscious at times and nonconscious at others. Furthermore, the description of considerations for adapting this implicit method may be useful for those studying other, similar social psychological constructs, for which the implications of the limits to self-report methodology that this thesis explores are likely to be equally relevant.

Altogether, this program of research aims to shed light both on how achievement goals are mentally represented and how the factors in everyday learning situations may influence achievement goals operating at a conscious and/or nonconscious level. This will ultimately enhance researchers'

⁴ For example, researchers have observed behavioral differences in whether and how soon participants interrupt a research confederate's conversation after participants have been primed to be either polite or rude (experiment 1, Bargh, Chen, & Burrows, 1996). Examples of nonconscious cognitive and achievement-related goals are provided in section 3.2.4.1.

understanding of the achievement goals students pursue and how these can be better conceptualised, captured, and, if need be, acted upon to improve their learning experiences.

1.7 Assumptions

Given that this thesis will be critically examining the assumptions underlying achievement goal theory, it is only fitting that the assumptions underlying the thesis arguments are also made explicit at this time. First is the assumption that achievement goals, as cognitive representations and part of the cognitive revolution in psychology, are real, as has been covered in terms of critical realism in Section 1.2.2, and will be expanded upon in Section 1.7.1. Secondly, as will be addressed in Chapter 2, achievement goals are assumed to simultaneously guide and provide an end for individuals' achievement behaviors, with real antecedents and real consequences. Thirdly, as will become apparent in Chapter 3 of this thesis, it is assumed that achievement goals can be either consciously or unconsciously selected or activated, pursued and fulfilled.

1.7.1 Ontology and Epistemology

This thesis is underpinned by depth realist assumptions. As previously referred to in Section 1.2.2, depth realism offers both an ontological and an epistemological approach from which to select an appropriate methodology. Given that ontology represents the nature of reality, and epistemology the means for accessing this reality, if reality is considered to be stratified and differentiated, as is held by depth realists (Bhaskar, 1978), researchers must select and make explicit which level they are attempting to access and ensure that the methods they choose are appropriate for accessing that level of reality.

The current environment within achievement goal research is largely based on a cognitive understanding of behavior and decision-making. This is consistent with the cognitive revolution in psychology that occurred in the 1950's as a response to predominantly behaviorist approaches such as those of Skinner (1938) and Watson (1913). Instead of focusing solely on outwardly observable stimulus-response relationships, achievement goal research follows the cognitive approach of valuing internal states such as thoughts and feelings. If

achievement goals are located in a cognitive reality, then the methods deemed appropriate for accessing achievement goals are those that can access students' meanings. Questionnaires and interviews that ask students about their achievement goals are thus assumed to provide valid and adequate methodological choices.

However, advances in research on implicit cognition, which itself stems from the cognitive revolution, have suggested the ever-increasing prevalence of a cognitive unconscious in everyday behavior and decision-making (see Chapter 3). Implicit cognition findings have changed what is known about cognitive reality. Hence although the location of the reality of several cognitive constructs stays the same, the awareness and accessibility, as part of the epistemology or how this reality can be known, has been altered. General cognitive and behavioral goals can be consciously selected, pursued and fulfilled, but research has shown that they can also be nonconsciously activated, pursued, and fulfilled. Thus the methods used to access them must take a nonconscious element into account. Overall, such research reveals a richer and deeper dimension to cognition, which requires not only an acknowledgement of the more complex reality and epistemology of cognition, but also a more suitable toolbox of varied implicit and explicit methods to capture goals, including achievement goals.

1.8 Validity

In essence, this thesis thus presents an investigation into the validity of achievement goal constructs and methods within a context of the nonconscious. In the words of Messick, the thesis represents “an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the *adequacy* and *appropriateness of inferences and actions* based on test scores or other modes of assessment’ (Messick, 1989, p. 13, emphasis in the original). This thesis provides an integrated evaluative judgment of the degree to which reasoned argument (Chapter 3) and empirical evidence (Chapters 4, 5, 6, and 7) support the adequacy and appropriateness of predictions and practical recommendations for interventions that are based on how achievement goals are currently conceptualized and assessed (Chapter 2).

However, given the methodological focus of this thesis not only in its critiques of current achievement goal methodology but also in its empirical explorations, it both provides the integrated evaluative judgment and is itself open to such judgment. It poses questions about the validity of current operationalizations, concurrent validity, and construct validity, and can itself, in terms of the empirical investigations it carries out, be assessed in terms of predictive validity, discriminant validity, and construct validity.

1.8.1 Assessing the Validity of Current Goal Operationalizations

Cohen, Manion, and Morrison (2007) define operationalization as the process of “specifying a set of operations or behaviors that can be measured, addressed or manipulated... [thus] translating a very general research aim or purpose into specific concrete questions to which specific, concrete answers can be given” (p. 81). In other words, operationalization represents the process of translating an abstract construct into a measureable concept. In this thesis, such operationalization can mean translating the concept of an achievement goal into answerable questions on an achievement goal questionnaire, and as with all operationalizations, is open to an assessment of construct validity, or whether the translation provides an adequate representation of the original construct (Trochim, 2006). However, for this assessment to be made, the original construct must be well defined. A commonly acknowledged issue in achievement goal theory is the variety of interpretations and assumptions underlying achievement goal definitions. For example, Elliot and Murayama (2008) identify the primary challenge and difficulty for achievement goal theory as the “long-term struggle to assess achievement goals in a conceptually rigorous manner” (p. 613), such that both the definitions and the operationalizations proceeding from these definitions are clear. The quality of operationalizations, or what is actually measured, cannot be adequately determined if what the operationalizations purport to measure remains unclear.

For example, Senko, Hulleman, and Harackiewicz (2011) point out that achievement goal researchers often conflate demonstrating ability and outperforming others in their operationalizations of performance goals, a key

achievement goal construct. As a result, two questionnaires that purport to adhere to achievement goal theory might employ two different ways of operationalizing performance goals; the same can be said for whether achievement goal methods focus on the goal or reason for a goal (Elliot & Thrash, 2001) or assume goals to be state-like or trait-like. This difference can be masked when making collective judgments regarding the consequences of pursuing performance goals. Such operational conflation, resulting from a lack of clarity in definitions, has been shown to interfere firstly in the clarity of assessing whether the findings of achievement goal research support theoretical predictions governing the consequences of performance goals, but can also have effects further afield, in terms of gaining a cumulative research base from which to suggest practical interventions aimed at improving motivational approaches. The issues with clearly defining and operationalizing achievement goals are particularly relevant to this thesis and are thus explored further in Chapter 2, given the need to identify the assumptions underlying the definition of achievement goals as a prerequisite for assessing the extent to which it can be shown to accommodate an implicit dimension.

Another issue in current achievement goal research is that of convergent validity. Convergent validity is upheld when the findings of methods that claim to measure the same underlying theoretical construct are consistent (Trochim, 2006). When findings are divergent, however, researchers may be unclear as to whether this is a factor of the research design or the phenomenon under study. In achievement goal research at present, goals are commonly measured using self-report measures such as questionnaires. Given certain criticisms of questionnaires (for more details, see Chapter 2, Section 2.2.3), interviews have been employed and yet have found conflicting results. There is thus a lack of convergent validity in achievement goal methodology. Chapter 2 identifies such issues with validity, while Chapter 3 presents a methodological argument for why such divergence may be occurring.

Construct validity is closely tied to convergent validity in that the latter is required when different methods are compared in order to assess the former, the overall extent to which a theoretical construct is an accurate reflection of the reality it tries to represent. This thus represents an ideal type of validity,

especially in terms of depth realism, and given that researchers are limited in their ability to fully know reality.⁵ Within achievement goal research, the closest researchers can get to determining whether the construct is valid is through ensuring that the methods they use to explore and further theory are carefully and continually checked and revised. In the assessment of how well current methods contribute to the construct validity of achievement goals, this thesis suggests that there are both definitional and methodological issues impairing the construct validity of achievement goals, and that research on implicit cognition must be taken into consideration in addressing these issues.

1.8.2 Being Assessed for Validity

This thesis not only evaluates the validity of currently employed achievement goal operationalizations; it puts forward several new operationalizations within its empirical investigations of implicit achievement goals, and can therefore also be assessed for predictive, discriminant, convergent, and construct validity.

Predictive validity involves making an assessment of whether the measure actually predicts what it is meant to predict (Trochim, 2006). In this thesis, in addition to the use of questionnaire methods, implicit methods are used to assess the potential for nonconscious achievement goal pursuit. Each of these methods can be assessed for how well they actually predict individuals' achievement behavior, as well as for how well they do this in different conditions (i.e., amidst attempts to prime goals).

It has been argued that using convergent (discussed above, see Section 1.8.1) and discriminant techniques can help to address construct validity (Campbell & Fiske, 1959; Cohen, Manion, & Morrison, 2007). Both can be assessed within this thesis. Discriminant validity is observed when two measures or operationalizations that are theorized to differ actually differ (Trochim, 2006). In this thesis, an argument is made regarding the limits of introspection, which suggests that it may not always be possible to accurately report on one's

⁵ The paradox inevitably is that our problematic measures are our only available means for attempting to access reality.

achievement goals. The conditions in which this would occur are instances of nonconscious goal activation, pursuit, and fulfilment. Within these conditions, the findings of implicit methods should diverge from those of explicit, self-report methods, such that low correlation coefficients would be expected and thus should be observed between implicit and explicit methods. The findings of an implicit operationalization of achievement goals, such as the IAT score obtained using an implicit association test for achievement goals, should theoretically also show both convergent and predictive validity by correlating with non-self-reported behavioral indicators such as timed persistence and attempts on an achievement task.

Finally, in terms of construct validity, the thesis can be assessed in two ways. One way is the extent to which it improves the construct validity of achievement goal operationalizations, by attempting to clarify the theory and its underlying assumptions, and improve and diversify its operationalizations. The second way the thesis can be assessed for its own construct validity is the extent to which the implicit method designed for capturing achievement goals adequately operationalizes achievement goals as they are defined in this thesis.

Summary

This introductory chapter has outlined the main tasks of this thesis, the rationale for accomplishing these tasks, their contribution and significance to the field when completed, and the assumptions and validity concerns that govern this endeavor. The next chapter addresses the first task of the thesis, namely, providing a background to achievement goals, before critically considering how they are operationalized within achievement goal research.

2 Achievement Goals: Issues in Definition and Measurement

Introduction

The first aim of this thesis is to *understand current operationalizations of achievement goals and the assumptions underlying them*. This chapter sets out to meet the first part of this aim, regarding current operationalizations, and although it goes some way towards setting up the second part of the aim, regarding assumptions, these receive a continued discussion in Chapter 3.

Understanding current operationalizations of achievement goals involves answering two questions, *what are achievement goals?* And, *how are they operationalized?* Answering these questions requires understanding how goals have been defined in the achievement goal literature, which can be accomplished by exploring both the theoretical work that has been done on defining students' goals for studying and the empirical work in which the methods inform and have been informed by these definitions. This chapter is thus split into two parts, each focussing on one of these questions. The first part traces the trajectory of achievement motivation from its beginnings in Murray's (1938) need for achievement to McClelland and Atkinson's (McClelland, Atkinson, Clark, & Lowell, 1953) work on achievement motives, through to the development of achievement goal theory. It indicates early theoretical definitions of achievement goals, as well as areas of difficulty in arriving at a consensus as the construct has developed, evidenced in conflicting operationalizations and findings.

The second part of the chapter delves into the methods that are employed in accessing achievement goals, shows how goals are operationalized in these methods, and provides a critique at the methodological level. By undertaking these tasks, Chapter 2 answers both guiding questions and paves the way for the subsequent chapter's exploration of problems with the underlying assumptions of achievement goal theory and methods, and discussion of what research on nonconscious processing might contribute to how we define and set out to capture achievement goals.

2.1 What are achievement goals?

Today's definitions depend on the theoretical beginnings and developments that came before, hence the first section of this chapter documents the development of the study of achievement motivation culminating in the achievement goal.

2.1.1 Beginnings of Achievement Motivation

Achievement goal theory is one of several popular theories of *achievement motivation*, which include (amongst others) expectancy-value theory (Wigfield & Eccles, 2000), intrinsic motivation theory (Deci, 1975; Deci & Ryan, 1985), self-determination theory (Deci & Ryan, 1985), and interest theory (Renninger, Hidi, & Krapp, 1992). Achievement motivation is the study of behavior, cognition, and affect⁶ in achievement settings, most commonly in educational contexts, although theories of achievement motivation can apply in any achievement-focused domain (e.g., business, medicine, and sports). Elliot and Dweck (2005, p. 3) point to evidence of a scientific interest in understanding individuals' motivation to achieve in the way it is understood today as far back as the work of James (1890), Ach (1910), and Hillgruber (1912). William James's interest lay in comprehending the link between achievement strivings and self-evaluation, Ach's in the effects of intentions on perseverance, and Hillgruber's in how increasing the difficulty of a task influences an individual's performance on that task.

Prominent theoretical developments within the study of achievement motivation that would ultimately lead to the creation of achievement goal theory appeared later, in the work of Murray (1938), McClelland (McClelland, Atkinson, Clark, & Lowell, 1953), Lewin (Lewin, Dembo, Festinger, & Sears, 1944), Atkinson (1957, 1964), and Weiner (Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, 1971). Each of these researcher's contributions are linked to today's definitions of achievement goals, albeit in ways that have understandably undergone considerable refinement and adaptation. Indeed, Elliot (2005) points out that "both Dweck and Nicholls viewed the achievement

⁶ The list goes on, including for example, "evaluation anxiety, goals, competence perceptions, values, and explicit theories" (Elliot & Dweck, 2005, p. 4).

goal construct as more of an integration of new and existing concepts than as a completely novel construct created *ex nihilo*” (p. 55).

2.1.1.1 Murray

Murray’s (1938) *Explorations in Personality* provided both a construct and a method for researchers interested in studying achievement motivation. In his explorations, Murray used the Thematic Apperception Test (TAT), a psychoanalytic, fantasy-based method developed by Morgan and Murray (1935). The TAT examined the motivational content of participants’ story responses to ambiguous images, with the logic that they would project their internal states in their stories.

Using this method, Murray identified a range of twenty manifest needs, including the need for achievement (n Ach) along with others, such as the needs for affiliation (n Aff), dominance (n Dom), and autonomy (n Auto). A need in general was defined as “a force which organizes perception, apperception, intellection, conation and action in such a way as to transform in a certain direction an existing, unsatisfying situation” (Murray, 1938, p. 124), whereas the need for achievement specifically was defined as a desire to

accomplish something difficult. To master, manipulate or organize physical objects, human beings or ideas. To do this as rapidly, and as independently as possible. To overcome obstacles and attain a high standard. To excel one’s self. To rival and surpass others. To increase self-regard by the successful exercise of talent. (Murray, 1938, p. 164)

Murray’s n Ach was thus a personality variable that indicated the stable extent to which an individual has an internal force directing them towards mastery and accomplishment. This, he argued, was associated with the following actions:

intense, prolonged and repeated efforts to accomplish something difficult. To work with singleness of purpose towards a high and distant goal. To have the determination to win. To try to do everything well. To be stimulated to excel by the presence of

others, to enjoy competition. To exert will power; to overcome boredom and fatigue. (Murray, 1938, p. 164)

Murray also noted that the presses of the need for achievement were the task itself and rivals, reminiscent of current absolute/task and normative/other-based dimensions in achievement goal theory. In terms of accessibility, the beginnings of achievement motivation thus assumed that the need for achievement was accessible via indirect, projective measures, rather than by directly asking the individual.

2.1.1.2 McClelland

Murray's taxonomy of needs provided the raw material for McClelland and colleagues (McClelland, Atkinson, Clark, & Lowell, 1953) who in the 1950's adapted Murray's need for achievement construct in *The Achievement Motive*. In this seminal text, McClelland and colleagues reported on their experimental work, using a combination of the TAT (with some modification to its interpretation procedures) and the animal motivation method of arousing motives (i.e., by manipulating task instructions, tasks, and success and failure experiences on achievement-related tasks), to explore and build up a theory of human achievement motivation.

McClelland and colleagues moved the need for achievement away from what they interpreted as a reactive, deficit-reducing need towards a proactive motive. The new need for achievement was focused on the *directedness* of behavior and was theorized to operate in connection with affective arousal. A motive was defined as "the redintegration [previous learning] by a cue of a change in an affective situation" (McClelland et al., 1953, p. 28), prompting in the individual the response either to approach or avoid the achievement situation. It was argued that all motives are learned, and that the need for achievement most likely results from "standards of excellence" in childhood. If parents imposed these "standards of excellence" on the tasks their children accomplished, the children would have high achievement motivation, as compared to parents who did not impose these standards on their children's task accomplishment, and their children's subsequent low achievement motivation. It was also suggested that children's consequent positive or

negative affect would arise through their success or failure to accomplish tasks to the required standard. As such, the theory suggested that there are “two kinds of achievement motivation, one of which appears to be oriented around avoiding failure and the other around the more positive goal of attaining success” (McClelland, 1951, p. 202). Consequently, assessing an individual’s achievement motive using the indirect, projective TAT method required establishing not only that they possessed a need for achievement but also whether this need was characterized by an approach or avoidance valence.

2.1.1.3 Lewin

Around this time, Lewin and colleagues (Lewin, Dembo, Festinger, & Sears, 1944) were conducting work on parallel theories of motivation, namely the level of aspiration (Dembo, 1931) and the theory of resultant valence (Escalona, 1940; Festinger, 1942). Level of aspiration was defined as “the level of future performance in a familiar task which an individual, knowing his level of past performance in that task, explicitly undertakes to reach” (Frank, 1935, p. 119). By speaking of levels of performance, the theory accorded *goals* a central role in directing achievement behavior. Individuals were theorized as having overarching ideal goals and situation specific action goals, and important discrepancies could be perceived between these latter goals and individuals’ expected performance, past performance, and actual performance. Espousing a current action goal (e.g., scoring from the halfway line in football) higher than one’s level of past performance (e.g., scoring from inside the box) was said to comprise a positive discrepancy, whereas the inverse was considered a negative discrepancy. Links were made between various, relatively consistent gradients of discrepancy and one’s realism regarding achievement (Sears, 1940), as well as individual personality differences (Sears, 1941) such that children with a low positive discrepancy or realistic level of aspiration were also rated by their teacher as being “highly confident, successful and comfortable in their achievement” (Lewin et al., 1944, p. 352), whereas those who had a higher discrepancy between their past performance and their current action goal were characterized as having poorer academic achievement, low self-confidence, and feelings of incompetence (*ibid.*).

Choice of the level of aspiration, or the action goal, was calculated as part of the theory of resultant valence. Here, the level of aspiration was that which had the highest resultant weighted valence. This was posited mathematically as the sum of the products of the valence of success and its subjective probability, and the valence of failure and its subjective probability. According to Lewin and colleagues, the subjective probabilities for success and failure depended on past experience, the activity's goal structure, and the individual's wishes, fears, and expectations (Lewin et al., 1944, p. 366-367), whereas the valence of success and failure differed by person depending on their tendency to seek success or avoid failure. For example, if an individual judged him or herself to be failing, their tendency to avoid failure, referred to as the force on the person away from failure ($f_{P, -Fai}$, Lewin et al., 1944, p. 373), would be greater. Thus the values on the failure valence scale increase and the individual's level of aspiration would be lowered. Finally, the tendencies to seek success ($f_{P, suc}$) and avoid failure also impacted on the individual's reaction to achieving or not achieving their level of aspiration, including their affect, rationalizations, and whether they persisted or desisted (Lewin et al., 1944, p. 375).

Although Lewin and colleagues' work framed the motivation of behavior in terms of goals, they neglected to provide a clear definition of the term (Elliot & Fryer, 2008). Nevertheless, their theorizing implied that goals could be conceived of as both "goal striving", entailing the "valenced" activities or objects that attract or repel the person" and "goal setting," denoting the "specific targets or aspirations that individuals select and strive to attain in achievement situations" (Elliot & Fryer, 2008, p. 243).

2.1.1.4 Atkinson

John Atkinson's (1957, 1964) elaboration of the need for achievement drew from his contributions with McClelland and colleagues as well as from work by Lewin and colleagues on level of aspiration. Atkinson defined the need for achievement as the "capacity to experience pride in accomplishment" (Atkinson, 1964, p. 214), thus representing the affect-based, disposition-like motive for success (M_s), while the motive to avoid failure (M_{AF}) was characterized by the possibility of failure and the emotion of shame. According

to Atkinson, an individual's tendency of approaching (hope of success) or avoiding (fear of failure) an achievement situation could be determined first by calculating the product of the motive for success or to avoid failure (M_S, M_{AF}), how probable that success or failure was (P_s, P_f), and the incentive value of that success or failure ($I_s, -I_f$). In this model, it was assumed that success at a more difficult task, which would hold a lower probability of success, would be linked to greater feelings of pride. Failure at an easy task, which would hold a lower probability of failure, would be linked to greater feelings of shame. Next, subtracting the resultant tendency to avoid from the resultant tendency to approach determined whether the individual's overall behavior would be characterized by approach or avoidance. If the resulting tendency to approach was a negative value, the individual would be likely to avoid the achievement situation, whereas if the tendency to approach was positive, the individual would be likely to engage.

In Atkinson's studies, the TAT was used to measure the motive for success.⁷ A different measure, the Test Anxiety Questionnaire (TAQ, Mandler & Sarason, 1952), was used to operationalize the motive to avoid failure, and interestingly this was a direct, self-report measure.⁸ Consequently, each individual could be classified as having high or low motive for success *and* high or low motive to avoid failure, with varying consequences for achievement behavior and performance. For example, in a study with Litwin (Atkinson & Litwin, 1960), Atkinson found that those who were higher in the motive for success took greater risks on a ring toss game, in terms of the percentage of shots made from further distances from a target, than those with a higher motive to avoid failure. Furthermore, those with a higher motive for success also persisted for longer on a final three-hour exam, and received higher scores on a final exam than those who had a higher motive to avoid failure.

⁷ Atkinson and Litwin (1960) also explored the French Test of Insight (French, 1955), another projective instrument.

⁸ The indirect method for the motive to approach success and self-report method for the motive to avoid failure seems to be the result more of the methods that were available at the time, rather than an explicit theoretical decision denoting the differential accessibility of the success and failure motives.

2.1.1.5 Weiner

Work on attribution theory and achievement conducted by Weiner and colleagues (Weiner, 1972, 1974; Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, 1971) also impacted heavily on early achievement goal theorists' thinking. According to attribution theory, individuals explain their success or failure in terms of luck, ability, effort, and task difficulty. Effort and ability are classed as internal factors, while task difficulty and luck are external factors. In terms of stability, effort and luck are unstable, while ability and task difficulty are considered stable. Attributing one's success or failure to internal or external, and stable or unstable factors was argued to produce different outcomes. For example, if an individual attributed their failure internally to their ability, which was considered stable, then it was likely that their motivation might suffer, as they would believe they were unable, and would always be, to succeed in that task. On the other hand, if an individual attributed their failure internally to their effort, which they deemed changeable, then it was likely they could be motivated to complete a task, by increasing their effort.

When seen in terms of achievement motivation, it was posited that high achievement motivation is linked with internal causal attributions for success, feelings of pride in accomplishment, persistence in the face of failure, and choice of tasks of intermediate challenge, whereas low achievement motivation was linked with internal causal attributions for failure, such as lack of ability, and external attributions for success, such as task difficulty or luck.

2.1.2 Summary

The achievement motivation constructs covered up till now have mostly assumed that achievement motivation is dispositional: Murray's need for achievement, McClelland's achievement motive, Lewin and colleagues' discrepancies and level of aspiration, Atkinson's motives for success and to avoid failure, and even to an extent, Weiner's attributions. The early theories of achievement motivation also mostly assumed that the various motivational constructs should be accessed using indirect, projective methods, implying some lack of possibility for introspection and instead the need for trained markers, and to a smaller extent, self-reports (e.g., motive to avoid failure, Test

Anxiety Questionnaire), seeming to suggest otherwise. By the end of the 1970's, researchers dissatisfied with the largely dispositional explanations for achievement motivated behavior (Dweck & Wortman, 1982) began to examine cognitive goals as potential explanations for individual differences in achievement behavior, leading to the first theories of achievement goals.

2.1.3 Beginnings of the Achievement Goal

In the late 1970's, psychologists at the University of Illinois, Carol Dweck, John Nicholls, Martin Maehr and Carole Ames, began to organize meetings from which the earliest publications on achievement goal approaches followed (e.g., Maehr & Nicholls, 1980; Nicholls & Dweck, 1979; for reviews, see Elliot, 2005; Murayama, Elliot, & Friedman, 2012). How these early achievement goals were defined drew heavily on the research conducted by the individual psychologists.

2.1.3.1 Dweck

Dweck's (1986) dichotomous framework of *learning* and *performance* goals originated in work she and colleagues had conducted on responses to failure (Diener & Dweck, 1978; 1980; Dweck & Reppucci, 1973). Diener and Dweck's explorations systematically examined the cognitive-motivational verbalizations accompanying two clear responses to failure. The researchers asked children who had been classified as either *helpless* or *mastery-oriented* to complete a discrimination task. The design of the task involved eight training problems and then induced failure on four test problems. This task allowed for the study of children's hypothesis-testing and learning strategies before and after failure. When some children failed, their verbalizations indicated a strong focus on finding the cause for the failure. In ultimately attributing their failure to a lack of ability, these children forgot their previous successes, and their performance suffered, even on tasks they had shown they were capable of solving. These children's behavior was characterized as depicting a *helpless* response to failure. Other children, who had performed similarly to the previous group prior to the failure, instead looked at their own effort and ways to constructively negotiate their way to success. These children did not show the same diminished performance on later tasks, and were described as possessing a *mastery-oriented*

response to failure. Encountering failure brought out a constellation of differences between the two types of responses. Systematic differences were observed in the children's verbalizations in terms of affect, amount of task-relevant and irrelevant statements, persistence, expectancy of success, self-instructions, strategy use, and approach to challenge. For example, when encountering failure, helpless children increasingly voiced negative affect, such as "This isn't fun anymore" versus the much more adaptive response of "I love a challenge" from mastery-oriented children (Diener & Dweck, 1978, p. 459).

Delving deeper to try to explain these individual differences required addressing the weaknesses of both attribution theory and achievement motives, which, respectively, were unable to account for the reasons underlying the maladaptive attributional response and failed to acknowledge the role played by cognitions (Murayama, Elliot, & Friedman, 2012, p. 192). Dweck proposed that students had goals guiding their achievement behavior: goals were at the root of the different responses to failure that she had observed. *Learning goals* were linked with the mastery-oriented response to failure, and *performance goals* with the helpless response to failure. Where those with learning goals sought to develop their competence in achievement situations and used failure feedback to moderate their effort input, those with performance goals sought to demonstrate their competence and attributed their failure to a lack thereof. Additionally, Dweck argued that individuals' implicit beliefs about ability acted as antecedents to their goal pursuit, such that those who believed ability to be stable and unchangeable, the *entity theorists*, were more likely to attribute failure to a lack of ability and pursue performance goals, and those who believed that ability could be improved, the *incremental theorists*, were more likely to make effort attributions and pursue learning goals (Bempechat, London, & Dweck, 1991).

2.1.3.2 Nicholls

Nicholls's conception of achievement goals stemmed from his research on changes in students' motivation and views of ability and effort during the transition from elementary to middle school (Nicholls, 1983). Nicholls (1984) observed:

For young children, high ability is implied by learning or by success at tasks they are uncertain of being able to complete. They do not judge ability with reference to performance norms or social comparisons. When more effort is needed for success, this implies more learning, which is more ability. Effort can have quite different implications for adults and older children. They realize that, though more effort produces more learning, higher effort can imply lower ability if others require less effort for the same performance. Effort is a two-edged sword (Covington & Omelich, 1979) only for adolescents and adults. (p. 41-42)

For younger children, ability thus seemed to be conflated with effort, judged against a self-criterion, which Nicholls described as a less differentiated view of ability. Older children and adults were more likely to feel they were being judged against the ability of others and distinguished more between effort and ability, and were described as having a differentiated view of ability (Nicholls, 1978, 1984). Applying an undifferentiated view of ability to an achievement situation, Nicholls (1984) argued, could be seen as leading to *task involved goals*, while applying differentiated views would lead to *ego involved goals*. As with Dweck's theory, competence was at the heart of these achievement goals, in that "achievement behavior is that in which the competence of one's behavior is at issue – where the goal is to be, or to appear to be, competent rather than incompetent" (Nicholls, 1984, p. 40). Furthermore, perceived ability was argued to impact on the outcomes of these goals, such that the ego involved goal could lead to the selection of tasks of moderate challenge when perceived ability was high, but to either extreme of easy or difficult task challenge when perceived ability was low (Nicholls, 1984).

2.1.3.3 Uniting the field

By the late 1980's, Ames and Archer (1987, 1988) unified the achievement goal theories that were emerging into a collective field by suggesting the term *mastery goals* in place of mastery focus, task-involved, and learning oriented, and *performance goals* in place of ability focus, ego-involved, and performance oriented goals (Ames, 1984; Dweck, 1986; Dweck & Elliott, 1983; Maehr, 1983;

Maehr & Nicholls, 1980; Nicholls, 1983, 1984). They argued that these new terms could be applied to describe the theoretically similar dichotomy of competence development and demonstration goals, and many subsequently employed these terms in their continued achievement goal research.

2.1.4 Major theoretical developments to the present

2.1.4.1 From Dichotomous to Trichotomous

Although these theories of achievement goals began as dichotomies, they have developed considerably over the years. Looking to previous achievement motivation theorists' (McClelland, Atkinson, Clark, & Lowell, 1953, Atkinson, 1957) approach and avoidance valences, discussed earlier, Elliot (1994) argued that a performance avoidance goal could be added to the achievement goal framework in order to help explain the diversity of processes and outcomes related to the adoption of performance goals (Ames, 1992; Urdan, 1997). This transformed achievement goal theory into a trichotomous model (Elliot, 1994; Elliot & Harackiewicz, 1996; Elliot & Church, 1997),⁹ in which performance goals were bifurcated: a performance approach goal oriented an individual "toward the attainment of favorable judgments of competence" (Elliot & Church, 1997, p. 218), whereas a performance avoidance goal oriented the individual toward "avoiding unfavorable judgments of competence" (Elliot & Harackiewicz, 1996, p. 461). The three-factor model was validated by several researchers (Elliot & Church, 1997; Middleton & Midgley, 1997; Skaalvik, 1997; VandeWalle, 1997), and linked the three goals to different antecedents and consequences (Elliot, 1999). For example, maladaptive processes and outcomes previously associated with performance goals as a unitary construct such as fear of failure, low competence expectancies, low intrinsic motivation, and low graded performance now seemed to be explained by performance avoidance goals (Elliot & Church, 1997), while for adaptive constructs such as intrinsic motivation, similar levels were found for performance approach and mastery goals (Elliot & Harackiewicz, 1996).

⁹ According to Elliot and colleagues (Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001), Dweck and Elliott (1983) had already been implicitly incorporating an approach-avoidance dichotomy but this was not explicitly laid out until the trichotomous framework.

2.1.4.2 The 2 x 2 Goal Framework

By 2001, Elliot and McGregor had posited an avoidance valence for mastery goals, resulting in a fully balanced two-by-two, competence valence by definition, framework (Elliot & McGregor, 2001, see *Figure 1*). Herein, mastery avoidance was characterized by a negative valence, a focus on avoiding incompetence, and an absolute/intrapersonal competence definition (Elliot & McGregor, 2001). Multiple factor analyses were conducted to confirm the validity of the model, and the four constructs were shown to “predict a distinct pattern of achievement-relevant processes and outcomes” (Elliot & McGregor, 2001, p.515). This finding has repeatedly been supported by subsequent research (Elliot & Murayama, 2008; Finney, Pieper, & Barron, 2004; for a review, see Elliot, 2005), with findings suggesting that mastery avoidance goals are less adaptive than mastery approach goals, but less maladaptive than performance avoidance goals. More research on mastery avoidance goals remains to be done, especially given findings showing that respondents may endorse mastery avoidance items on goal questionnaires as a result of misinterpretation (Carr & Marzouq, 2012; Ciani & Sheldon, 2010).

		Definition	
		Absolute/ intrapersonal (mastery)	Normative (performance)
Valence	Positive (approaching success)	Mastery- approach goal	Performance- approach goal
	Negative (avoiding failure)	Mastery- avoidance goal	Performance- avoidance goal

Figure 1. The 2 x 2 framework

Note. Adapted from Elliot and McGregor (2001, p. 502).

2.1.4.3 The Multiple Goal Perspective

As performance approach goals started to be associated with more positive learning processes and outcomes previously only associated with mastery goals, debates have arisen over when and whether to encourage performance approach goals. This brought the multiple goal perspective into focus. In their

multiple goal perspective, Harackiewicz and colleagues (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002) argue that students “can and do pursue multiple goals” (p. 640). Indeed, Skaalvik (1997) has suggested that goals should be viewed as orthogonal rather than as oppositional poles on a continuum. However, others have contended that performance approach goals will only have adaptive consequences when they are pursued along with mastery approach goals (Midgley, Kaplan, & Middleton, 2001). In response, Harackiewicz and colleagues (2002, p. 641) conducted an analysis comparing independent and interactive effects of performance approach and mastery goals in terms of academic performance and interest in college students, and found that performance approach goals could have a positive impact on achievement outcomes *without* the student simultaneously holding a mastery approach goal. At present, while some intuitive criticisms have been shown to lack empirical support, Senko, Hulleman, and Harackiewicz (2011) point to directions for continued research in exploring the nature and affordances of the multiple goal perspective for achievement goal research.

2.1.4.4 Competence at the Core

A similar theoretical move has been to more explicitly centre achievement goal theory on a core concept of *competence* (Elliot, 1999; Elliot & Thrash, 2001; see also Elliot & Dweck, 2005). Proponents have argued that “competence motivation is ubiquitous in daily life...has a substantial impact on emotion and well-being...is operative across the lifespan, and...is evident in all individuals across cultural boundaries” (Elliot & Dweck, 2005, p. 6). In addition, adopting it as the conceptual core of the achievement goal approach systematically and straightforwardly “constrains the number of goal constructs that may be delineated” (Elliot & McGregor, 2001, p. 517), which affords greater clarity and theoretical parsimony (see also Section 2.1.5.2).

2.1.4.5 A 3 x 2 Goal Framework

One of the most recent developments in the field has come in the form of a 3 x 2 achievement goal framework put forward by Elliot, Murayama, and Pekrun (2011). This framework is argued to more carefully align achievement goal constructs with the theorized core of competence by shifting the focus more

explicitly onto the evaluative standards by which individuals gauge their competence. As such, the model argues for distinctions to be made between task-based (absolute) and self-based (intrapersonal) goals, previously contained within mastery goals, and other-based (interpersonal) goals, previously known as performance goals. In this model, goals retain their approach and avoidance valences, as can be seen in *Figure 2* below. Elliot and colleagues' (2011) findings supported the structural validity of the new model in comparison with previous achievement goal models and also suggested antecedents (approach and avoidance temperaments) and consequences (performance attainment, intrinsic motivation, learning efficacy, worry about exams, absorption during class, and energy in class) for the six goals. Other researchers have also recently begun to test the 3 x 2 model, including Wu's (2012) validation study with a sample of Taiwanese junior high and elementary school students, and Mascaret, Elliot, and Cury's (2015) adaptation of the model to the sports domain.

		Definition		
		Absolute (task)	Intrapersonal (self)	Interpersonal (other)
Valence	Positive (approaching success)	Task-approach goal	Self-approach goal	Other-approach goal
	Negative (avoiding failure)	Task-avoidance goal	Self-avoidance goal	Other-avoidance goal

Figure 2. The 3 x 2 framework

Note. Adapted from Elliot, Murayama, and Pekrun (2011, p. 634).

2.1.5 Defining achievement goals?

Despite all of this theoretical development, there has been surprisingly little consistency in how achievement goals are defined in the majority of the literature (see for example, Elliot & Thrash, 2001; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). Arguably, this is largely due to varying interpretations of theory that are seldom clearly stated before incorporation into the empirical design. Consequently, constructs are unwittingly conflated,

rendering the comparison of empirical findings a complex process, and one that is impeded by the necessity of understanding the implicit assumptions underlying studies and linking operationalizations to conclusions.

In response, the last decade has seen a wealth of definitional work that has attempted to highlight these commonly conflicting underlying assumptions. The intent of this work has been to clarify empirical findings both to advance the field and to allow for researchers to determine how achievement goal findings can be applied to practical educational settings. This definitional work has ranged from enhancing the precision of the component terms making up existing goal definitions, to dismissing some interpretations in favor of retaining theoretical parsimony.

2.1.5.1 Three different approaches

In a recent review of achievement goal theory, Murayama, Elliot, and Friedman (2012, see also Elliot & Thrash, 2001) have identified three different approaches to how researchers have defined achievement goals. The first approach defines an achievement goal as a “purpose for which a person engages in achievement behavior” (Murayama et al., 2012, p. 195). This was the approach first taken within the field by such authors as Dweck (1986) and Nicholls (1989). However, the problem with this definition is that a goal as a ‘purpose’ can have different meanings, such as the actual ‘end’ towards which an individual is working, as well as the ‘reason’ the individual is working toward it. Unarticulated differences in defining ‘purpose’ may lead to differences in findings that are unfortunately masked. A second approach has been to define a goal as an orientation (see Ames, 1992; Kaplan & Maehr, 2007), in which goals are understood as “a network or integrated pattern of beliefs and feelings about success, effort, ability, errors, feedback, and standards of evaluation that together provide a wide-ranging framework or schema toward achievement tasks” (Murayama et al., 2012, p. 195). The problem with this definition has been that it is better characterized as a descriptive, more macro-level model, given that it does not focus explicitly on an achievement *goal* as the active ingredient, and therefore makes it difficult to identify which aspect of the model leads to consequences of interest and thus areas for change. The third definitional

approach identified by Murayama, Elliot, and Friedman (2012), one that is clearly endorsed by the authors, is that of an achievement goal as “an aim with competence at its conceptual core” (p. 195). Murayama et al. (2012) argue that this definition truly focuses on the goal, reflects the valence and definition components of the two-by-two model, including the different evaluative standards for competence (absolute, intrapersonal, interpersonal), and the positive and negative valences (approach, avoidance).

2.1.5.2 Further definitional issues

Further issues with defining achievement goals come from debates over what qualifies as an *achievement* goal and an achievement *goal*, whether goals are dispositional and trait-like or more temporary and state-like, and how they are cognitively represented. How these questions are answered has important implications for what we measure, how we measure it, and what we find.

What qualifies as an *achievement* goal? Researchers have introduced such goals as work-avoidance goals (Meece, Blumenfeld, & Hoyle, 1988; Nicholls, 1989), extrinsic goals (Maehr, 1983; Pintrich & Garcia, 1991), and social goals (Urdan & Maehr, 1995; Wentzel, 1989, 1991). Although these goals have been linked with student achievement and with the academic achievement setting, given Murayama et al.’s (2012) aforementioned definition, they cannot be considered *achievement* goals in that they are not centrally focused on competence *per se*.¹⁰ On one hand, the exclusion of these goals might be considered overly parsimonious in that it favors one stream of achievement goal reasoning. On the other hand, the competence definition narrows the focus of achievement goal theory in a good way, by contributing conceptual clarity and precision. Moreover, it still allows for the study of achievement goals in other competence-based, non-academic life settings.

¹⁰ A topic that is yet to be widely discussed is what to do with competence-focused goals that are mentioned as part of more open-ended rather than forced-choice methodologies (see, for example, Lemos & Gonçalves, 2004). Furthermore, Kaplan and Maehr (2007) have warned that to use such a constrained definition of a goal may lessen its “phenomenological realism” (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010, p. 423).

What qualifies as an achievement *goal*? The question of where a goal starts and ends has also arisen, as suggested in the previous section discussing goals defined as orientations versus goals defined as aims. Urdan and Mestas's (2006) study of the reasons behind performance goals discussed whether the varying reasons students have for pursuing the same achievement goals might impact the results of pursuing that goal. However, Elliot (2005, p. 65) argued that while both goals and reasons are valuable constructs, *goals*, understood as aims, and the underlying *reasons* for these aims, must be held as conceptually distinct. The possibility that different underlying reasons might have an impact has then been incorporated into the idea of *goal complexes* (*ibid.*), which has recently begun to attract some research attention (see Dompnier, Darnon, & Butera, 2009).

Whether goals should be theorized (and operationalized) as trait-like or state-like is a long-standing question. To conceive of goals as entirely dispositional would imply a strong similarity to motives (see also Murayama et al., 2012, p. 199), whereas to conceive of goals as purely state-like could imply anywhere between having different goals for different classes (Maths and English Literature) or different goals for different aspects of a single class (essays and class presentations) to total unpredictability (group mates, day of the week, weather, etc.). Of course, these differences are important for how goals are operationalized: achievement goal methods must take these different degrees of context-specificity into account. Similarly, comparing findings across studies and designing interventions are inevitably affected. It is important to note that achievement goal theory originated in part in a critique of the overemphasis on dispositional constructs (Dweck & Wortman, 1982; Maehr & Nicholls, 1980), and a suggested move to analysis of more context-specific, cognitive processes. Ultimately, more explicit acknowledgment and discussion of this topic would be beneficial.¹¹

¹¹ Not with the goal of providing some sort of definitive answer of whether achievement goals are *either* dispositional *or* state-like, but more to achieve a consensus of how to cope with this topic methodologically and for generalization purposes.

A further issue underlying those just mentioned is how achievement goals are actually cognitively represented. For example, Pintrich (2000, p. 102) suggested intraindividual stability and contextual sensitivity do not have to be mutually exclusive: it depends on how we theorize the cognitive representation of achievement goals. From the body of achievement goal research, Pintrich (2000) extrapolates that goal theorists seem to imply “schema-theoretic ideas about representation” (p. 97). Within this sort of model, an achievement goal represents

a structured knowledge unit, or subjective, personal conception or “theory” (c.f. Nicholls, 1990; Smith, 1998) about the purposes for an achievement task as well as other elements in terms of how success and competence are defined, the role of effort and errors, and standards for evaluation. These elements would be activated together—that is, the whole schema or theory would be activated—as the individual encounters relevant information in the context...or through conscious explicit thought and awareness about the achievement task. (Pintrich, 2000, p. 97)

Verbal methods are an appropriate method for accessing goals according to this representation, but must still be tailored toward the correct context, for example when accessing situation-specific or more general goals (Pintrich, 2000, p. 97).

While the schema-theoretical model represents an “object-oriented approach to goals” (Pintrich, 2000, p. 98), Pintrich argues that goals may be represented differently, in a connectionist or parallel distributed processing (PDP) model. Within this more dynamic model, nodes form a network, parts of which are activated in different situations (Pintrich, 2000, p. 98, but see also Shah & Kruglanski, 2000). In achievement goal terms, the nodes could be understood as comprising different aspects of goals (i.e., definition of success, role of effort and errors, standards for evaluation), while the pattern of activation through specific parts of the network comprises the achievement goal. This model is endorsed by this thesis. A goal is much more dynamic in the connectionist model, drawing in part from both the situation and the individual, yet

intraindividual stability is attainable: although paths between nodes are activated in different ways based on how they interact with factors in the individual's surrounding environment, paths that are often activated in the same way may be strengthened over time and therefore become more readily activated (Pintrich, 2000, p. 99). Importantly, this model allows for multiple goals to be activated simultaneously (see Section 2.1.4.3), does not require consciousness for the goal to operate (see also Section 3.3), and poses questions regarding the best methods for accessing this type of representation.

2.1.5.3 Summary

The previous three sections have explored the beginning of the achievement goal construct, its theoretical developments to date, and aspects of its definition that are often (and problematically) taken for granted. There is still much to be done to further clarify these aspects of achievement goals, but in the meantime, the next section looks at how researchers have worked with what they have to operationally define and access students' achievement goals.

2.2 How are achievement goals operationalized?

Despite the aforementioned issues with defining achievement goals, much research has been done into the links between this achievement motivation construct and important educational processes and outcomes. How this research has been conducted has also helped to operationally define achievement goals and provide new directions for how goals are theorized. The next section of this chapter provides a critical look at each of the most common methods that have been used to capture students' achievement goals and how they have operationalized goals. In doing so, the following sections answer the question, *how are achievement goals operationalized?* In providing critiques of these operational definitions and methods, the following sections also highlight points that contribute to answering the question, *how should achievement goals be operationalized?*

Given that the conceptual development and advancement of a theory go hand in hand with what is considered theoretically consistent methodology, the following section explores chronologically and critically the methods that have been used to investigate achievement goal theory over time, leading to the

present moment. It begins with the think aloud protocols used in some original, exploratory studies, then moves to experimental manipulations, and finally comes through to the questionnaire and interview present.

Of course, it is possible to see these different movements in achievement goal methodology as linear and logical in retrospect, but in reality these ‘phases’ do not possess discrete, clear boundaries, and run into the present. In part this is due to the nature of research generally, and to the variety in research questions and methodologies chosen to explore these questions. However, this can also be argued to result in part from the aforementioned sustained lack of consensus in defining goals and determining how best they should be studied. As such, though the following sections move from one dominant method to another in a seemingly logical manner, this does not mean that these methods have entirely fallen out of use. Although the use of experimental manipulations was more common in the late 1980’s and early 1990’s (for reviews, see Rawsthorne & Elliot, 1999; Utman, 1997), they are still used now (e.g., Standage, Treasure, Hooper, & Kuczka, 2007), albeit in a way that reflects the influence of intervening findings and methodological discussion. The somewhat linear path presented in the following section thus draws on the methods that have predominated at different times, critiques of these methods, and the methodological responses to these critiques.

2.2.1 Think Aloud

Looking at the work that would set the stage for the development of achievement goal theory helps to provide an idea of the original behavior that characterized achievement goals, allowing for contrast with later methods. Diener and Dweck (1978), for example, conducted two studies examining children’s responses to failure on hypothesis-testing tasks using verbal methods. In both studies, they sought to explore individual differences between children with what had come to be termed *helpless* and *mastery-oriented* responses to failure. Dweck would later look to achievement goals as the reasons for these different responses. In the studies, children were taught a discrimination learning task over eight practice problems, and were then assessed on the type and sophistication of their strategy use on four test

problems. These latter four were unsolvable, inducing a failure experience. In one study, once children had finished the task, they were asked why they believed they had had difficulty solving the last four problems. In the second study, children were encouraged to think aloud from the seventh and eighth training problems until the end of the task. Both methods provided a slightly different means for the systematic comparison not only of the types and sophistication of strategy use denoting performance before and after failure, but also of the affect, attributions, and cognitions of children in both the helpless and mastery-oriented groups.

By asking the children to voice the reasons they felt they had had difficulty solving the four test problems in the first study, Diener and Dweck were able to assess attributions the children may have been making during their failure. They found that fifty-two percent of children in the helpless group claimed they were “not smart enough” (1978, p. 456) while not one of the mastery-oriented children made this claim. This would later develop into Dweck’s implicit entity and incremental theories of intelligence (Dweck & Leggett, 1988; Dweck, 1999). By using the think aloud method *throughout* the second study however, Diener and Dweck gained access to a real time, dynamic understanding of what concerned the children during some of the training problems and for the entirety of the test problems. In this way, they could appreciate the sharp contrasts between verbalized reactions during the training problems and the failure on the first test problem, in which both groups of children made similar comments regarding the usefulness of their strategies, and the next three failure problems, in which helpless children largely made ability attribution statements such as “I never did have a good rememory” (1978, p. 458) while mastery-oriented children again made few attributions and instead spent more time verbally monitoring their progress with statements such as “I should slow down and try to figure this out” and “The harder it gets the harder I need to try” (1978, p. 459). In addition to attributions to loss (or lack) of ability, examining the children’s verbalizations illuminated further differences in terms of statements of negative affect, solution-irrelevant statements, amount of self-instruction, and ineffectual task strategy.

The most important aspect of Diener and Dweck's (1978) studies methodologically speaking is their use of the think aloud research strategy in the second study. Firstly, this allowed the children to verbalize those aspects of their experience on the task that were most important to them *as soon* and *as often* as they felt or thought them. As a result, the ecological validity of this approach presents an advantage over artificially inducing or asking participants at researcher-specified times about what they are thinking or why they are behaving as they are. In other words, the children got a chance to frame their own behavior and thoughts. To the research program of the two combined studies, this provided a chance to understand how the children's behavior, cognitions, and affect changed from their success on the training problems to their failure on the test problems. However, it could be argued that by asking the children to think aloud, Diener and Dweck were changing the failure situation as, for example, children may have been more attentive to their cumulative performance and felt their failure more acutely, not to mention the effect of the experimenter's presence and the potentially uncommon one-on-one situation. An attempt is made at addressing these issues in the authors' mention of an earlier study carried out by Dweck and Gilliard (1975). This study provided empirical support showing that asking participants to make expectancy of success statements at pre-specified times, such as prior to each trial, prior to the first and last trials, and prior to only the last trial, is obtrusive and impacts on persistence. They warned how "by asking for a report we may be distorting the very process that we are attempting to understand" (Dweck & Gilliard, 1975, p. 1083). One argument fuelling their concern was that of an "implicit social demand" (Dweck & Gilliard, 1975, p. 1077). For example, imagine the researcher asks a participant to make an expectancy of success statement prior to each trial out of four. If, prior to the first trial, the participant voices an expectation that they are highly likely to succeed on it *but then fails*, they are likely to feel that as the researcher has seen them fail, they must amend their expectation of success on the next trial accordingly. Such implicit aspects might have resulted in children in Diener and Dweck's (1978) study feeling a pressure, albeit an unnecessary and unintended one, to make steady verbalizations, explain their behavior, and in turn become more aware of their own behavior than they would have been had they been working on their own.

However, it is clear that Diener and Dweck (1978) considered this, by pairing the think aloud study with the first study wherein they asked participants at the end of the task why they might have found it difficult to get the test problems correct. As a result, the first study can be seen as a check of the unexpected influences of the think aloud method, to determine whether findings were similar for helpless and mastery-oriented individuals. Indeed, both studies showed similar patterns of statistically significant differences in performance after failure between helpless and mastery-oriented children (Diener & Dweck, 1978, p. 457).

Ultimately, the studies were essentially exploratory in terms of gathering characteristics of the helpless and mastery-oriented groups, and for this reason, employing the think aloud method was well suited. Moreover, the use of the think aloud method shows that through ascribing value to the children's verbalizations as highlighting motivation-relevant cognitions in the face of failure, Diener and Dweck (1978) were ascribing value also to outwardly verbalize-able aspects of achievement goals. In turn, this means that some aspects of achievement goal-related behavior could be accessed via self-report. However, the next direction in achievement goal research, that of experiments, did not seem to place such an emphasis on aspects that could be verbalized, and instead focused on inducing achievement goals in order to investigate possible antecedents and consequences.

2.2.2 Experimental Manipulations

2.2.2.1 Advantages

Following on from these think aloud studies that predated and gave rise to achievement goal theory, educational researchers sought to explore the antecedents and consequences of pursuing certain goals. The design selected for doing so was the experimental manipulation, in which achievement goals were often induced, using task descriptions and instructions alluding to normative evaluations or learning aspects, and then explored in terms of behavior on tasks. Looking back, Murayama, Elliot, and Friedman (2012) have recently commented “although a number of studies have utilized experimental

manipulations, interventions, and observational methods, these studies are relatively rare” (p. 202).

The advantage of using experiments, however, is that they can help provide evidence to establish causal models for how achievement goals impact on achievement outcomes of interest to researchers and educators. They provide a way for researchers to ostensibly manipulate the achievement situations in such a way as to control out of their design any non-goal-related explanations for participants’ behavior on an achievement task. This enables researchers to distinguish between the consequences of pursuing different goals.

Furthermore, the internal validity of this method is not reliant upon self-report, thereby lessening bias due to participant subjectivity (Murayama, Elliot, & Friedman, 2012, p. 202).

2.2.2.2 Work conducted with experimental manipulations

Early examples of such experiments were Butler’s (1987) work on goals as differential predictors of performance, Jagacinski and Nicholls’s (1987) study of the impact of social comparison information on students’ task and ego involvement, Elliott and Dweck’s (1988) investigation into goals and their impact on students’ choice of tasks, performance in the face of difficulty, attributions, and expressions of affect, and Stipek and Kowalski’s (1989) study into whether goal pursuit was linked to the use of effective learning strategies. These were followed in the early nineties with studies such as Graham and Golan’s (1991) work on goals and levels of information processing, Harackiewicz and Elliot’s (1993) study of achievement goals and intrinsic motivation, and Elliot and Harackiewicz’s (1996) exploration of whether endorsing a performance approach or avoidance goal undermined intrinsic motivation.

2.2.2.3 Challenges with experimental manipulations in achievement goal research

However, certain issues pertain to the use of experimental manipulations, some of which tend to plague all experiments and some of which are specific to experimental manipulations of achievement goals. In order to highlight these,

Elliot and Harackiewicz's (1996) study of achievement goals and intrinsic motivation is considered in further detail.

In experiment 1 of their study, Elliot and Harackiewicz (1996) investigate the then recently theorized distinction between performance approach and performance avoidance goals by examining how these may differently predict intrinsic motivation. From the outset, this requires the operationalization of the achievement goals (the independent variables) and intrinsic motivation (the dependent variable), and the need to indicate a high likelihood of causality. The different goals are operationalized via varying task instructions and intrinsic motivation is measured with free-choice persistence as a behavioral indicator and task enjoyment as a self-report measure.

Elliot and Harackiewicz split participants into four induced goal conditions, comprising three performance goal groups and one mastery goal group. Students in each of the three performance groups read that the purpose of the task is "to compare college students to one another in their ability to solve hidden figure puzzles" (i.e., Nina puzzles, Elliot & Harackiewicz, 1996, p. 464). The remainder of the written explanation then differs. Students in the first two performance conditions, performance approach and performance avoidance, are informed that the task is a diagnostic for success or failure, respectively, while students in the performance neutral goal condition are not given this diagnostic information. All performance condition participants are told that once they complete the task they will find out how they have done in comparison to other students. In the fourth condition, the mastery goal group, the task explanation reads that the researchers are interested in collecting "data on college students' reactions to hidden figure puzzles" (*ibid.*), and that upon completion, they will be told the "percentage of the total hidden Ninas" (*ibid.*) that they have found within the 90 seconds given to solve each puzzle.

The logic of the experiment is that the normative comparison with *positive* possibility as relayed by the task instructions should induce a performance approach goal in the first performance condition. Theoretically, these participants will then show similar intrinsic motivation to participants in the mastery goal condition. The normative comparison with *negative* possibility

should induce a performance avoidance goal in the second performance condition, negatively impacting on their intrinsic motivation. Finally, the task- and self-based instruction should induce a mastery goal for those in the mastery condition. The study findings suggested that, as hypothesized, the only condition to undermine intrinsic motivation was the performance avoidance condition.

However, there were several issues with the achievement goal operationalization through task instruction. The mastery goal condition, for which the instructed purpose was to collect students' *reactions*, strangely did not include any instructions "about learning anything from the experience or trying to develop one's skills at solving hidden figure puzzles" (Brophy, 2005, p. 170), which are essential aspects of the mastery goal construct. Also, by adding the phrases "This session will give you the opportunity to demonstrate that you are a good puzzle solver" (Elliot & Harackiewicz, 1996, p. 464) for those in the performance approach condition, and "This session will give you the opportunity to demonstrate that you are not a poor puzzle solver" (*ibid.*) for those in the performance avoidance condition, the researchers may have shifted the emphasis from normative comparison onto just "trying to do well" (Brophy, 2005, p. 170), which is associated with mastery goals. Hence these task instructions were meant to activate only the desired goal but may have activated another goal simultaneously, in so doing calling into question the validity of the performance goal operationalization. Indeed, these goals are usually characterized both by normative comparison and demonstrating competence or avoiding demonstrating incompetence.¹²

Elliot and Harackiewicz (1996, p. 464) do mention that they conducted a manipulation check: when they asked participants to state the purpose of the experiment, the majority were able to answer correctly regarding the normative comparison (performance approach and performance avoidance) or solving Nina puzzles *without* mention of normative comparison (mastery goals). However, this means that the participants remembered the task instructions of

¹² The difference Elliot (2005) and Urdan and Mestas (2006) make between appearance and competition aspects of performance goals.

the experiment; it does not necessarily equate to an explicit indication of what goal they pursued, or that they were even aware of pursuing a goal. It also does not indicate that participants in the performance approach and performance avoidance conditions would have been able to distinguish between the differently construed diagnostic explanations and consequently make an informed decision to either try doing better or avoid doing worse than other, unknown students. Indeed, an additional explanation for the performance approach intrinsic motivation finding could be that being told that students tend to do well might assure the participants in the performance approach condition that they, too, will fit into this trend, thereby alleviating any pressure that might cause a negative challenge appraisal, ultimately freeing them to enjoy the process more explicitly and resulting in higher perceived intrinsic motivation. It does not mean that they would necessarily take on performance approach goals, however, and thus provides a challenge to the internal validity of Elliot and Harackiewicz's (1996) study.

A further, more general issue underlying this study, as with other experiments, is that of low ecological validity. The study was carried out in a laboratory, in which "participation is a one-shot, isolated experiment" (Brophy, 2005, p. 170) without real consequences similar to those students encounter in their usual achievement settings, such as a known peer group to compare their competence with or the potential to progress to a higher level of understanding and mastery. In terms of internal validity, in this study, Elliot and Harackiewicz encountered further difficulty in attempting to transform goal definitions into explicitly presented task instructions, finding an appropriate way of measuring what goals participants did pursue, and determining whether these matched the goals the researchers had intended to induce. These criticisms highlight how despite providing the possibility to explore causal relationships, there are considerable methodological difficulties in using experimental manipulations to assess achievement goals and their impact on achievement processes.

2.2.3 Questionnaires

2.2.3.1 Advantages

Questionnaires have been suggested to provide an improvement on experimental inductions of achievement goals (e.g., Elliot & Harackiewicz, 1996). In the last section, it was shown that a problem with experimental manipulations of achievement goals is that the internal validity of suggested relationships between goals and achievement outcomes can be unclear. This uncertainty was shown to stem from difficulty in distinguishing between participants' understanding of the instructions representing the goal operationalizations of the different conditions and whether or not participants actually pursue the goal the researchers try to induce. Within goal theory, the use of questionnaires has been used as a way of allowing for the measurement instead of the manipulation of achievement goals (Elliot & Church, 1997, p. 219), which attaches value to asking students about what goals they may have rather than just trying to induce them in a controlled laboratory setting, where they may act differently to how they usually would in an achievement setting. Indeed, Koskey, Karabenick and colleagues (2010) have suggested that the “predominance of student self-reports reflects the pervasive social-cognitive perspective that privileges individuals' subjective experiences” (p. 254-255).

Whereas experiments can help answer causal questions, questionnaires can be used to link self-reported achievement goal orientations with important achievement-relevant outcomes. On questionnaires, goals are operationalized through carefully planned statements intended to correspond as exclusively as possible to the underlying goal constructs. Standardized statements allow for comparison between participants and lessen the time required for, and ambiguity of, interpreting participants' responses. Overall, questionnaires can be given easily to large numbers of respondents, take little time to administer, and are a low-cost method.

2.2.3.2 Work conducted with questionnaires

In part due to such ease, questionnaires are the most common method for assessing achievement goals to date. Although there exist multiple others, the

two most prevalent questionnaires employed in assessing achievement goals are the Patterns of Adaptive Learning Scales (PALS, Midgley et al., 2000) and the Achievement Goal Questionnaire (AGQ, Elliot & Church, 1997; Elliot & McGregor, 2001; *AGQ-Revised*, Elliot & Murayama, 2008). The PALS is comprised of several different subscales, of which the most pertinent to students' personal achievement goals is the 14-item *personal achievement goal orientations* student scale, whereas the AGQ-R has 12 items designed uniquely to assess students' achievement goal endorsement. While PALS uses the trichotomous goal framework, with five items each for mastery and performance approach goals and four items for the performance avoidance goal, the AGQ-R has three items for all four of the goals of the 2 x 2 framework.

On these questionnaires, participants are asked to think about either their general or domain-specific goals. Participants are assumed to be able to introspect, access, and comment on their goals, such that their endorsement of questionnaire items implies their pursuit of these goals in achievement settings. Participants must indicate their level of agreement with the goal statements on a Likert scale. For example, participants might select 5, "very true" for the statement "One of my goals in class is to avoid looking like I have trouble doing the work" (performance avoidance goal item 4, PALS, Midgley et al., 2000, p. 13) or 7, "strongly agree" for the statement "My goal is to avoid performing poorly compared to others" (performance avoidance goal item 6, AGQ-R, Elliot & Murayama, 2008, p. 617). All of the items addressing each of the types of goals is then added up and averaged to provide a subscale for each achievement goal.

Questionnaires have been used in the exploration of statistical antecedents, mediators, and consequences of pursuing different achievement goals. Researchers have used questionnaires to explore the positive associations of achievement goals, such as the relation between performance approach goals and academic performance (Elliot & Church, 1997), task value (Bong, 2001), academic self-concept (Skaalvik, 1997), and effort expenditure (Elliot, McGregor, & Gable, 1999); and mastery goals and help-seeking (Ryan & Pintrich, 1997), interest (Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997), and self-regulation (Middleton & Midgley, 1997). Questionnaires have also

been used to explore maladaptive links, for example between performance approach goals and fear of failure (Elliot & Church, 1997; Elliot & McGregor, 1999) and performance avoidance goals and academic self-handicapping (Midgley & Urdan, 2001).

2.2.3.3 Challenges with questionnaires in achievement goal research

In recent years, these questionnaires have undergone revisions to incorporate changes in achievement goal concepts – especially the approach-avoidance distinction – and to improve their face validity. To this end, PALS reflects the trichotomous model of achievement goals, asking students about their performance approach, performance avoidance and mastery approach goals. In its revision, the authors removed “items that assess intrinsic value, and...references to specific behaviors...[to focus] more directly on the goals as orienting frameworks within which students function rather than behaviors or interests that students exhibit or teachers encourage while learning” (Midgley et al., 2000, p. 3). Interestingly, while removing prefixes such as “I would feel...,” (Midgley et al., 2000, p. 9) and “An important reason why...,” (Midgley et al., 2000, p. 7) for their affective and value references, the authors have used “It’s important to me that...,” (Midgley et al., 2000, p. 13), which should attract the same critique. The revised PALS prefix “One of my goals is to...,” (Midgley et al., 2000, p. 13) is closer to those employed in the revised AGQ (Elliot & Murayama, 2008). Here, again, the authors accept that “particular AGQ items do not optimally correspond” to the conceptual foundations they emerged from (Elliot & Murayama, 2008, p. 613). Thus prefixes alluding to values or concerns such as “It is important for me to...,” or “I worry that...,” are replaced with no more than three explicit goal and aim prefixes, “My goal is to...,” “My aim is to...,” and “I am striving to...,” (Elliot & Murayama, 2008, p. 617). These are subtle but important changes, which enhance the precision of the operationalized goal constructs.

Though the creators of both the PALS and AGQ-R have subjected their questionnaires to rigorous psychometric testing, there remain difficulties with the prickly issue of construct validity. The aforementioned changes made to

achievement goal questionnaire items intended to improve face validity may reduce other researchers' confusion as regards the operationalization of the achievement goals in the questionnaires. However, the questionnaire statements remain restrictive considering that students may not actually think in terms of goals when they are in achievement settings. In other words, administering achievement goal questionnaires assumes that students conceptualize their achievement behaviors in terms of goal strivings and that they actively set and pursue these goals. Furthermore, ensuring questionnaire items are internally consistent goes some way toward establishing questionnaire reliability, but it is more important and considerably more difficult to ensure the reliability of students' responses, which Koskey, Karabenick, and colleagues (2010, p. 255) argue are still "subject to concerns about the veracity of self-reports".

These concerns are interlinked and include researcher-imposed goal statements, respondents' various understandings and misunderstandings of these statements, and also endorsement of statements that respondents might not spontaneously mention if asked with open-ended questions. Researchers can do their utmost to ensure a measure is psychometrically sound, but when the measure is administered to students, the forced-choice response method can elicit a 'now-that-you-mention-it' effect (Urdan & Mestas, 2006). Students are limited in their potential responses, they are provided with statements that they can only agree or disagree with. Additionally, they cannot indicate if they have other, more pertinent goals or discuss what may be complex personal goal concepts in their own words. Urdan and Mestas (2006, p. 355) suggest that this may result in an overestimation of "the natural occurrence of mastery and performance goals in particular settings, such as classrooms and schools."

The reason for using these standardized statements is, of course, that researchers can consistently assess students' responses and make comparisons across their sample. Generally, a main strength of using questionnaires is the potential for consistency in responses and consequently analysis, in addition to their time effectiveness, and that they can be given to large amounts of respondents at a time. The difficulty with assuming consistent responses and analysis, however, stems from a further issue regarding the veracity of students'

responses on questionnaires: the assumption that respondents understand the goal statements as the researchers intend. *Assuming* that all respondents understand the questionnaire items in the same way is unreasonable, given that even researchers' understandings of these items are so often varied and multifaceted. *Ignoring* these varied understandings is far worse as there is clear evidence that invariability is often not the case. Urda and Mestas (2006) interviewed participants who had higher than median scores on the performance approach and performance avoidance subscales of the Patterns of Adaptive Learning Scales (PALS). They found that participants "often failed to distinguish between the approach and avoidance dimensions of performance goals even when asked to respond to survey items that were designed to make this distinction" (Urda & Mestas, 2006, p. 362). In one such example, participants explained their responses to performance avoidance items with performance approach descriptions such as "Yes, I want to do better than others" (Urda & Mestas, 2006, p. 363).

Ciani and Sheldon (2010) also found that questionnaire goal statements can mask participants' misunderstandings of goal items. In their study, elite college baseball players were asked to answer achievement goal items and then provide open-ended written explanations describing their endorsement. The researchers found that although roughly half of their participants were high endorsers of mastery avoidance goal items, this seemed to be a result of misinterpretation as only two out of nine endorsements were followed with a written explanation that correctly described the goal. In contrast, participants who were low endorsers of the mastery avoidance goal provided valid written explanations. Ciani and Sheldon suggested that follow-up questions or interviews may have furnished the researchers with a better understanding of whether participants were misreading the question, were mentally reframing mastery avoidance goals into mastery approach or considered "approach and avoidance motivation as logically equivalent" (2010, p. 131). Murayama, Elliot and Friedman (2012) argue that respondents must be making these distinctions, otherwise their responses would not load onto individual factors during factor analysis (see also Murayama, Elliot, & Yamagata, 2011). Nevertheless, these are serious issues and clearly indicate that enhancing researchers' precision in

distinguishing goal statements goes only so far in ensuring the robustness of achievement goal questionnaires.

Furthermore, in their current configuration, achievement goal questionnaires do not sufficiently take into account the potential for individuals' goals to change over time and/or in different situations. They provide a snapshot of the individual's goals at one point in time.¹³ With the added endeavor of correlating these achievement goals with relevant achievement outcomes, this suggests the measurement of achievement goals as disposition-like, rather than specific and context-based (see Section 2.1.5.2).¹⁴ On one hand, this latter issue of specificity and context is arguably addressed by the domain-specific¹⁵ rather than generalized nature of the goal statements on both PALS and AGQ-R, which ask respondents to keep a specific class or course in mind, rather than thinking about their goals in general (which would even more clearly imply achievement goals as trait-like). However, on the other hand, this does not allow for respondents to mention differing goals they may have in relation to the different aspects of a course, such as reading and comprehension in preparation for seminars, essay writing, or exam preparation. Although the argument could be advanced that repeatedly administering current achievement goal questionnaires could provide a longitudinal idea of how students' goals may change over time (e.g., Lieberman & Remedios, 2007), the act of making the questionnaires more dynamic and in the moment or integrating items to assess the time/goal change dimension would allow for even single time series studies to explore these issues. It is likely that this would provide a more complex, albeit more holistic measurement of students' achievement goals.

¹³ This presents an interesting contrast to the dynamic, in the moment think aloud method used by Diener and Dweck (1978) in the earlier studies of achievement goals.

¹⁴ One way of addressing this issue is to repeatedly administer achievement goal questionnaires to the same individuals over a specific time period; Murayama, Elliot, and Friedman (2012) recommend this approach should be taken more often.

¹⁵ For PALS, this domain-specificity applies to students in middle school and older. For younger children in elementary school, the statements on PALS ask students to respond thinking of "class or schoolwork in general" (Midgley et al., 2000, p. 2), given that these children spend most of their time in a single classroom.

A further issue lies in the strategies respondents use while answering questionnaires. While the anonymity of completing achievement goal questionnaires might be argued to occasion more honest responses, it is not difficult to anticipate what the ideal responses are and tailor one's responses accordingly. Mastery approach items are intrinsically more positive and likely to be aspired to.¹⁶ Performance approach goals, although ultimately associated with success, present a version of success that comes at the expense of others. Indeed, agreeing strongly that one endorses the goal of doing better than other students requires that these 'others' do worse. Explicitly endorsing this goal most likely requires that the individual possess strong feelings of competence, and alludes to a further issue that Brophy (2005) introduces regarding the epiphenomenal potential of performance scales on questionnaires. Brophy argues that the "endorsement of such items is realistic only for higher achievers whose past histories of success on similar tasks make it reasonable for them to expect to do better than most of their peers" (p. 173; see also Elliot & Church, 1997; van Yperen, 2003). If one has been at "the top of the class" previously, and has thus experienced *doing better than others* it is likely that they will select a response that reflects this. In sum, questionnaires may perpetuate researchers' goal definitions, assume participants understand researchers' intended goal operationalizations, and do not rule out desirability effects or the use of self-presentational strategies.

¹⁶ The concept of aspiration highlights an important question regarding the purpose of achievement goal questionnaires. On one hand, weighing up how you would like to view yourself or be viewed by others could be seen as an integral part of a goal that is defined as forward-facing, as represented by Elliot and Fryer's (2008, p. 244) definition of an achievement goal as "a cognitive representation of a future object that the organism is committed to approach or avoid." If goals are thus defined, there is no challenge to the validity of an achievement goal questionnaire that is capturing aspirations. On the other hand, if the purpose of the achievement goal questionnaire is to capture which goals an individual is more likely to pursue, rather than aspire to, in an achievement situation, then this possibility that the questionnaire might be capturing aspiration rather than reality lends the questionnaire a problematic ambiguity. More explicit discussion of the purpose of achievement goal questionnaires is thus in order, as this issue has direct ramifications for the program of exploring the predictive validity of questionnaires.

Thus, while experimental manipulations can provide information to illuminate causal relationships, albeit with considerable difficulty in design, an advantage of using questionnaires should be that they enable students to express the nature of the goals they actually pursue in achievement settings. However, this does not seem to equate to the nature of achievement goal questionnaires in their current manifestation, the formats of which only provide the options to agree or disagree with what will be understood by researchers as performance approach, performance avoidance, mastery approach, and mastery avoidance items, giving the impression that students themselves actually *do* pursue these goals and *only* these goals (Brophy, 2005, p. 168).

2.2.4 Interview Methods

2.2.4.1 Advantages

Such problems with experimental and questionnaire methods have led some to advocate the use of interviews in order to access learners' achievement goals. Those that have called for (Brophy, 2005) and conducted (e.g., Dowson & McInerney, 2003; Lemos, 1996; Mansfield, 2012; Urdan & Mestas, 2006) interviews to access learners' achievement goals have done so in attempts to avoid researcher-defined operationalizations of goals as critiqued above. They are interested in investigating the meanings students themselves give to their goals for achievement (Urdan & Mestas, 2006, p. 364) in more naturalistic, non-laboratory classroom conditions (Lemos, 1996, p. 154).

In most cases, the interview format selected is that of the semi-structured interview. This can be adapted on an individual basis to the experiences of the interviewees, allowing for interviewees to comment on achievement settings *they* are familiar with, and providing the space for the complex and unexpected in responses. Achievement goals are here accessed through asking learners about their behavior in achievement settings. Interviewees describe *in their own words* what goals they have, if any, in achievement settings, and also explain which are more pertinent in which situations. The use of semi-structured interviews additionally provides space for interviewers to ask follow up questions when responses are unclear, thus allowing for a better understanding of the interviewee's experience. It is claimed, "such research can yield benefits

for theory (i.e., how goals are defined and conceptualized) and for research (i.e., how achievement goals can be assessed and examined)” (Urdan & Mestas, 2006, p. 364).

2.2.4.2 Work conducted with interviews

Approaches to using interviews in achievement goal research have varied, in part due to the limited number of studies that have used this method. As such, there is no common means by which achievement goal interviews are conducted that can be readily adopted by others wanting to explore achievement goals using interviews (which in turn might prevent some from using the method and adding to the body of interview research). Within this sparse environment, the use of interviews has ranged from a secondary method to explore the answers participants provide on questionnaires to the primary research method in attempts to access students’ goals directly.

Lemos’s (1996) work with Portuguese sixth-graders is an example of the latter. Lemos asked students questions about specific achievement settings. These were phrased as “what” questions (e.g., “What do you want?” “What are you trying to accomplish?”), allowing the students to provide their own explanations. Lemos found that the goals students mentioned that related to achievement *per se*¹⁷ included working goals (e.g., “to finish it and to go on to the next one”, “to get it done”), evaluation goals (e.g., “desire to be positively evaluated and/or...avoid negative evaluations concerning academic classifications”), learning goals (e.g., “to know more about”, “to find out how”), and enjoyment goals (e.g., “activities in which they engaged for pleasure, enjoyment, and fun”). Brophy (2005, p. 171) cited Lemos’s study in arguing, “when allowed to describe their goals in their own words, students...seldom mention performance goals spontaneously”.¹⁸ Even in the goal students

¹⁷ These I myself consider to deal with achievement, in accordance with the Murayama, Elliot, and Friedman’s (2012, see Section 2.1.5.1) definition of goals as competence-based aims. Lemos (1996) actually considers seven goals that the sixth-graders mentioned (in addition to the goals already mentioned): complying goals, interpersonal relationship goals, and discipline goals.

¹⁸ Although Senko, Hulleman and Harackiewicz (2011) provide evidence that students do spontaneously report performance goals more frequently than reported by Brophy and colleagues (see Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Levy, Kaplan, & Patrick,

mentioned that was most similar to the aforementioned characterization of performance goals, the evaluation goal, “students...talked about getting good grades but not about displaying ability or looking good in comparison with their classmates” (Brophy, 2005, p. 171). Hence, exploring what goals the sixth graders brought up themselves indicated that mastery and work avoidance goals, among others, were more pertinent to their experience than performance goals as researchers define them.

Dowson and McInerney (2003) used various stages of interviews as a primary research method in their study of eighty-six middle school students’ goals. Their approach was unique in that it emphasized the need to be “*inductive, systematic, and contextual*” (original emphasis, Dowson & McInerney, 2003, p. 92). Initial conversational interviews, in which the researchers asked questions like, “Do you want to do well at school? Why” and “What sort of things motivate you to do well at school?” (Dowson & McInerney, 2003, p. 96) provided an idea of the range of students’ achievement goals. Students elaborated on these goals in subsequent semi-structured interviews, where they were asked questions such as “Are you motivated to do well at school because you want to get good marks? Why/Why not?” (p. 96). Finally, the researchers used structured interviews to investigate students’ agreement with the specific goal approaches they had ventured in previous stages, asking questions like, “Some students say that they have to want to beat other students before they can do good work at school, but they also like to be friends with people even when they want to beat them. Do you think this is true of you? What does it feel like when you beat one of your friends?” (p. 97). Dowson and McInerney found that the students mentioned and then expanded upon three academic goals proffered: mastery goals, performance goals, and work avoidance goals. This process elicited a more dynamic, multidimensional, and complex picture of students’ goals, in which “purposes for achievement moved freely between descriptions of various behaviors, affects, and cognitions” (Dowson &

2004; Urdan, 2004; Job, Langens, & Brandstätter, 2009), it is clear that in some research, participants do not make any mention of performance goals. Further discussion as to why this may be can be found in Murayama, Elliot and Friedman (2012, p. 199) with regard to how normative comparison is processed.

McInerney, 2003, p. 99), without favoring a single component *a priori*.

Furthermore, multiple goals were reported as being possessed simultaneously, and these often combined in different ways. Most importantly for the researchers, goals originated in statements the students themselves had made in interviews (Dowson & McInerney, 2003, p. 107).

Urdan and Mestas (2006) conducted interviews with students who had scored highly for performance approach and avoidance goals on the PALS. As the PALS scores provided the primary measure of the students' achievement goals, the interviews in this case performed the secondary role of illuminating the reasons behind the students' endorsements. As previously mentioned, it was at this point that the interviewers learned not only that the students had different reasons for endorsing performance approach or avoidance goals, but also that interviewees' definitions of performance goals differed from those intended by researchers. Indeed,

students often responded to the performance goal items in unexpected ways...to performance-avoidance items with approach explanations, saying they wanted to appear able or outperform peers even though the question asked about not performing or appearing worse than others. (Urdan & Mestas, 2006, p. 363)

The interviews showed that students perceived the normative demonstration of competence to be representative of their achievement behavior strivings, even if their interpretation of performance approach and avoidance goals differed from the researchers' intended meaning. Though this could have suggested merely having misunderstood or reframed the items, a third suggestion coming from Ciani and Sheldon's (2010) study of elite athletes, wherein respondents provided approach explanations for their avoidance responses, is that students in Urdan and Mestas's (2006) study might have considered "approach and avoidance motivation as logically equivalent" (Ciani & Sheldon, 2010, p. 131). This would suggest that although the distinction between approach and avoidance is statistically sound, it is not consistently reflected in how students understand their own goals.

More recently, Mansfield (2012) conducted focus group interviews with twenty-nine secondary school students, in groups of four or five students at a time. Mansfield (2012, p. 570) provided students with cards on which they were asked for written responses to the question, “Why do you want to achieve at school?” Once they had completed this, students were asked to explain their responses and discussion ensued, before the exercise was repeated with any remaining goals students wished to achieve at school. Finally, the researcher asked students to arrange their goals by importance, and to explain the reasons for their order. Along with future goals, social goals, and personal well-being goals, Mansfield found that students mentioned three types of achievement goals: mastery goals as they are defined generally in the literature, performance goals defined in terms of attaining or maintaining certain grades, and performance goals in terms of approach - wanting to do better academically than others (p. 571). Interestingly, Mansfield found that only sixteen of the twenty-nine (55%) students mentioned achievement goals as compared to all twenty-nine students mentioning future goals, twenty-eight mentioning social goals, and twenty-two mentioning personal well-being goals. Of these sixteen who mentioned achievement goals, eight (27%) mentioned performance goals in terms of grades, six mentioned mastery goals (21%), and only three (10%) mentioned performance goals in terms of wanting to do better than others. Hence, in Mansfield’s research, dichotomous mastery and performance goals did arise, although they varied in definition from how achievement goals have been conceptualised in the literature. For example, categorizing achievement goals in terms of grades as performance goals was problematic in that the attainment of good grades can be indicative of both mastery and performance approach goals, and the maintenance of such goals can be argued to imply an avoidance valence. Nevertheless, of note was the fact that students did not spontaneously mention avoidance goals, in addition to the fact that fewer students mentioned achievement goals than the other types of goals. The former echoes the issues with approach and avoidance seen in Urdan and Mestas’s (2006) and Ciani and Sheldon’s (2010) studies, while the latter seems to support Urdan and Mestas’s (2006, p. 355) and Brophy’s (2005, p. 168) arguments that questionnaire methods solely focusing on achievement goals may overemphasise their

importance to students' personal achievement experiences and their occurrence in achievement situations.

2.2.4.3 Challenges with interviews in achievement goal research

Conducting achievement goal interviews thus holds certain strengths over questionnaires and experimental manipulations. Researchers can find out not only how students interpret goal questionnaire items but also how, and the extent to which, they experience and explain achievement cognitions and behaviors in their own words. However, this does not mean that interview methods are unproblematic means of accessing achievement goals.

Indeed, even when interviews are carried out as systematically as described in the study by Dowson and McInerney (2003), interviewees may employ self-presentational strategies in order to represent themselves in a more positive light (see also Section 2.2.3.3). According to Goffman (1959), engaging in social interactions often gives rise to “impression management” (see also Schlenker, 1980). Taking this factor into consideration, it may be that participants are under-reporting certain goals. For example, Urdan and Mestas (2006) reported that even when students had strongly endorsed performance goals on the questionnaire, during the interviews, these same students rarely made statements that emphasised comparing themselves to others. This led Urdan and Mestas (2006) to suggest that the set up of one-on-one interviews with students can be problematic in terms of reliability, as “participants may be more reluctant to honestly discuss their goals and motives in school than if they were responding to an anonymous survey” (p. 364). Acknowledging Goffman's claims, students may have under-reported their performance goals during the interviews. Engaging in impression management might lead at least some students to avoid mentioning their desire to do better than others when in the interview situation. On one hand, the lack of mention of performance goals might be down to the fact that these social comparative/competitive goals just do not exist in classrooms in the way they are currently defined by researchers. On the other hand, considering the social *undesirability* (both to one's self-conception and how they desire to be viewed by the interviewer) of

spontaneously admitting that one wants to do or be perceived as doing better than their classmates, it is no wonder that few students mention these goals.

A further issue that may appear in interviews regarding achievement goals is suggested by Kaplan and Maehr (1999, p. 331), who point out about wanting to be successful that often “success...is evaluated in social comparison terms...”, that it is “[b]y definition...a limited commodity”. Even saying “It is my goal to do well...” in an interview then implicates underlying notions of doing well in comparison to others, among other aspects such as wanting to improve one’s own ability. Trying to understand what the interviewee means in such a situation, as part of the conversational setting of semi-structured interviews, makes it possible that the interviewer, despite their best effort, leads the interviewee to elaborate and make distinctions that they would not make themselves. Follow-up questions to clarify that the researcher has understood the interviewee’s implied meaning might in this case produce the same “now-that-you-mention-it” (Urdan & Mestas, 2006, p. 355) effect that is argued to exist in questionnaire settings. The extent to which interviewers might thus feel that they have understood sufficiently or not, and their subsequent questioning, can also vary among interviews, making it even harder to ensure consistency when conducting interviews.

Interviewees may have various interpretations of the interviewer’s question about what they want to achieve in school, and answer accordingly. By leaving the question open to allow for non-researcher-defined goals, one student might interpret the question as asking about long-term goals, which they are likely to be reminded of continually by their teachers, whereas another student might answer the question in terms of very specific goals that they have for very specific tasks. While this could be argued to allow for the individuals to share what meaning achievement has in their own lives, this variety also means that interviewees may be answering different questions, inevitably affecting the findings, including the extent to which achievement goals are mentioned in comparison to other goals.

This problem of understanding what students mean when discussing their achievement goals in interview settings impacts on the validity of researchers’

reports of what the students have said, and is compounded by the data analysis process. As an exploratory approach, the interview attempts to access students' subjective operational definitions of their goals for studying. But the products of these interviews remain raw information until coded within a subjective analytic framework developed by the researchers. During this process, it is undoubtedly difficult to depart from current theoretical conceptualization and categorization of goals; decipher whether students are speaking of one or another, or even several goals simultaneously; define the boundaries of verbal units; or determine whether students are discussing goal complexes (i.e., the goals and the reasons behind them, Elliot, 2005) or the specific aims they assume in certain achievement settings. There is a possibility of a conflict here. On one hand, there is the quest of the semi-structured interview to understand learners' achievement goals spontaneously and in their own words, in a way that values the meanings and importance the learner gives to them. On the other hand, there is the issue of distinguishing the goal from the reason, and the extent to which learners would even respond with goal-type explanations of their achievement behavior. This underlines the development of methods in achievement goal theory, as discussed till now. Think aloud protocols involved simultaneous engagement in achievement behaviors and achievement-relevant verbalizations from which goals were extrapolated via systematic coding. The move towards having students verbalize their goals, although returning to a learner-focused methodology, is difficult to reconcile with achievement goals as they are currently, narrowly defined. However, as so little work so far has been carried out using interviews as a means to access achievement goals, much more could be done to establish an interview system that could balance spontaneity and goal-focus. One possible way forward could be the combination of a flexible semi-structured interview and a more structured method, as with the Self-Regulated Learning Interview Schedule (Zimmerman & Martinez-Pons, 1986, 1990).

In addition, operationalizing achievement goals through gauging students' own definitions relies on the assumption that they are able to proffer these definitions and accurately comment on the goals they adopt. If they cannot, the validity of using interview methods to access students' goals for studying is

seriously undermined. On one hand, students may just not think of their actions in achievement settings as behavior meaningfully directed by goals, and thus offer up the first plausible reasons that come to mind when asked about them. Indeed, in his theory of self-perception, Bem (1972) argues that individuals' ability to introspect may be limited to what they can infer from their behavior, implying limits to interviewees' ability to comment on their achievement goal-directed behavior (see also Section 3.2.2). In other words, students may not expressly construct goals to follow, making it difficult for them to articulate answers to interview questions and questionnaire items. On the other hand, though it is understood that students can and do explicitly construct goals to direct their achievement behavior, the question of what happens if these goals are adopted automatically (for example, see Sections 3.1 and 3.2.6) remains a threat to not only interview methods, but any methods that assume that goals are entirely conscious, as will be discussed in the next chapter.

Summary

In sum, this chapter has considered the ways that achievement goals are defined and operationalized, in theoretical work and empirical work, respectively. The first part of the chapter outlined how achievement goals theoretically descend from work on achievement motivation, the aspects retained, and those that differ. Developments and disputes in theory and how these have affected the definition of achievement goals were also considered. The overarching conclusion of this first section was that achievement goal theory as a field has struggled with consistently and consensually defining achievement goals, including debates over goals as purposes, orientations and aims, as well as competence-based goals versus other types of goals operating in achievement settings, whether achievement goals are best understood as trait-like or state-like, and how they are cognitively represented.

The second part of the chapter then critically examined the methods that have been used in capturing achievement goals, with an emphasis on how these methods have operationally defined achievement goals. Think aloud methodology was linked with the founding of achievement goal theory and early exploration, operationalizing goals through a mix of behavioral and verbal

indicators that together suggested the participant's pursuit of a certain goal. Experimental manipulations were linked with beginning to explore causal relationships between different goals and relevant achievement goal outcomes, and operationalized goals through task instructions used to induce goals. Questionnaires were seen to predominate, providing correlational information about achievement goals, their antecedents and consequences, and relevant achievement outcomes, and operationalized goals through statements to which participants could indicate the extent of their agreement. Interview methods were shown as a more recent, albeit less frequently used, method, resulting from calls for more student-defined achievement goals, and operationalized goals through the descriptions students give in response to what and why questions regarding their academic achievement. Critiques were then levelled at each of the methods. Weaknesses of experimental manipulations included the lack of ecological validity, difficulty with ensuring task instructions differentiate appropriately between the different goals, and questions over whether induced goals were actually those pursued. Weaknesses of questionnaire methods included researcher-defined goals, forced choice responses, impression management, and respondents' possible misinterpretation of goal items. Weaknesses of interview methods included the possibility that follow up questions meant for clarification may direct the interviewees' responses, interviewees' impression management, and the difficulty of reconciling interviewees' responses with narrow achievement goal definitions during analysis.

Elliot and Murayama (2008, p. 616) claim that critiques of the operationalization of achievement goals are "not meant to invalidate these measures or the empirical work that has been produced by them," and indeed this chapter has focused on both the strengths and the weaknesses of these operationalizations. However, a further potential weakness that applies to all methods that rely on self-reports, such as manipulation checks in experiments, agreement with statements on questionnaires, and answers to questions in interviews, concerns the ability of individuals to introspect and comment on their goals. This is discussed in depth in Chapter 3, which introduces the concepts of automaticity and limited introspective access, and discusses

whether critique informed by these literatures not only offers a serious challenge to Elliot and Murayama's (2008) statement, but also to the definitions and operationalizations of achievement goals discussed till now.

3 A Case for Nonconscious Achievement Goals

We have, as human beings, a storytelling problem. We're a bit too quick to come up with explanations for things we don't really have an explanation for.

(Malcolm Gladwell, *Blink*, p. 69)

The first thing we learn from studying our own circuitry is a simple lesson: most of what we do and think and feel is not under our conscious control.

(David Eagleman, *Incognito: The Secret Lives of the Brain*, p. 4)

Introduction

In the last decade alone, books on the power of the unconscious in the everyday have grasped the public imagination and become bestsellers. Three such books are Nobel-prize winning psychologist Daniel Kahneman's (2011) *Thinking, Fast and Slow*, Rice University neuroscientist David Eagleman's (2011) *Incognito: The Secret Lives of the Brain*, and popular science writer Malcolm Gladwell's (2005) *Blink*. The popularity of these works has given some indication of the public fascination with recent research suggesting that our unconscious minds are busy at work in ways we are only beginning to understand. The implications of this idea in relation to how achievement goals are theorized and captured form the subject of this chapter.

Chapter 2 introduced achievement goals and issues in their definition and measurement. This chapter looks further at the assumptions underlying achievement goal theory in relation to the second aim of the thesis, to *examine the literature on implicit cognition and nonconscious goal pursuit, and identify the key implications of these literatures for the definition and operationalization of achievement goals*. Furthermore, it seeks to meet aim 3a of the thesis, which is to *assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through reasoned argument*. To accomplish these aims, the following chapter examines some of the ways in which research has begun to illuminate the power and prevalence of the unconscious. Initially, key terms are defined, before the

chapter goes on to answer two guiding questions, *what are the key findings from the various literatures on implicit cognition?* And *what are their methodological implications?* Once these guiding questions are answered, the chapter considers whether the implications of research on implicit cognition can be seen as applicable to goal-directed behavior and more specifically, achievement goal theory.

This chapter is split into three sections. In the first section, entitled *The Unconscious*, key findings from the literature on implicit cognition are considered in a loosely chronological order. The first subsection briefly highlights early philosophical ideas about the limits of consciousness within the history of psychology, looking at James (1890), Freud (1901/1965), and the behaviorists. The second subsection explores an early seminal review and research by Nisbett and Wilson (1977) into the limits of introspection, which suggested individuals often tell more than they can know. The next subsections examine research on the illusion of conscious will and the theory of apparent mental causation (Wegner, 2002; Wegner & Wheatley, 1999), research into automatic theory and automaticity conducted by Bargh and colleagues (e.g., Bargh, 1990; Bargh & Chartrand, 1999), and new ways of defining the unconscious including Kihlstrom's (1987) *cognitive unconscious* and Hassin, Uleman, Bargh and colleagues' (2005) *new unconscious*. The structure of each of these subsections includes the presentation of central arguments and empirical support (where applicable), followed by the implications these arguments hold for the conceptualization of achievement goals and how they can be accessed.

The second section of this chapter, entitled *The Unconscious and Achievement Goals* examines these implications further, particularly in relation to achievement goal theory assumptions of consciousness and accessibility. This section outlines how these assumptions have been challenged in motivation research and assesses the responses from achievement goal theorists. Finally, the structure of achievement goals is considered in comparison with that suggested by research on nonconscious goals, with the resulting argument: it is theoretically possible that achievement goals can be activated, fulfilled, and their accompanying affective effects experienced without conscious awareness

that this has occurred, with the consequence that individuals are thus unable to comment accurately on their goals.

In light of this argument, the third section of the chapter, entitled *Implicit Methods*, examines how nonconscious achievement goals could be explored, looking at methodological alternatives to conscious methods. It begins with a historically common implicit method, the Thematic Apperception Test (Morgan & Murray, 1935), and then moves to the methodological toolbox of more recent implicit methods, including the Implicit Relational Assessment Procedure (IRAP, Barnes-Holmes, Barnes-Holmes, Power, Hayden, Milne, & Stewart, 2006), trace measures (Zhou & Winne, 2012), priming (e.g., Bargh & Chartrand, 1999), and the Implicit Association Test (IAT, Greenwald, McGhee, & Schwartz, 1998). A case is made for using a combination of such methods to investigate potentially nonconscious achievement goals, ending this chapter and anticipating the next one, an empirical study doing just that.

3.1 Definitions

Given the varying fields from which the research outlined below is drawn, there are inevitably differences in term usage. It is important to clarify what is meant by these terms more generally. Definitions are thus proffered for the two main groups of terms, *conscious mental processes* and *automatic processes*. Conscious mental processes can be defined as “mental acts of which we are aware, that we intend (i.e., that we start by an act of will), that require effort, and that we can control (i.e., we can stop them and go on to something else if we choose...)” (Bargh & Chartrand, 1999, p. 463). Hence, awareness, intention, effort, and control are key elements of conscious processes. As will be discussed later in this chapter, achievement goal theorists assume that goals are such processes, and thus methodologically speaking, that it is appropriate to use self-reports to ascertain information about their goals. There is less of a consensus for what constitute automatic processes. Accordingly, two definitions are offered. On one hand, automatic processes can be defined as “intentional, goal-directed processes that [become] more efficient over time and practice until they [can] operate without conscious guidance” (Bargh & Chartrand, 1999, p. 463). On the other hand, there are also automatic processes that involve “perceptual analysis

or encoding of environmental events...[taking] place not only effortlessly, but without any intention or often awareness that it [is] taking place” (Bargh & Chartrand, 1999, p. 463-4). The former definition of automatic processes can involve processes such as learning to read sheet music, which begin as conscious and effortful processes but require less effort over time and practice. Examples of processes referred to in the latter definition are behaviors, attitudes (e.g., likes and dislikes), perceptions of others (e.g., race, gender, social class stereotypes), emotions, learning, and even goals; this is the definition of automatic processes used in this chapter. It is also important to note that the terms automatic, nonconscious, unconscious and the implicit are used interchangeably throughout this chapter to refer to this latter definition.

3.2 The Unconscious

3.2.1 Early Modern Unconscious

Much of the recent research on the limits of consciousness in psychology stemmed from the cognitive revolution that started in the 1950's. However, long before this, discussion concerning the role of the unconscious emerged in the writing of William James (1890). James conceived of the ‘empirical self’ as comprised of different types: the material, the social, and the spiritual (James, 1890, p. 292), of which, according to the interpretation offered by later authors, “only some portion...is knowable at any point in time...and even knowing a particular portion [is] difficult because much of human experience and action takes place at an unconscious level” (Murphy & Alexander, 2000, p. 37).¹⁹ Later researchers have also looked to James’s writings regarding the potential that a conscious choice may become superfluous in a process that is repeated consistently (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001), as well as his principle of *ideomotor action*, which suggests, “merely thinking about an action increases its likelihood of occurring” (Bargh & Chartrand, 1999, p. 465). These are important concepts in terms of the unconscious, as they do not require the attendant will that is usually assumed in the initiation of behavior.

¹⁹ There is inevitably argument regarding different interpretations of James’s position on the unconscious, see for example, Weinberger (2000), especially given the change in meaning of the term *unconscious* over time.

The individual most commonly associated with the unconscious, however, is Freud (1901/1965). However, the unconscious that is explored in this chapter is different from Freud's in important ways. Wilson (2002; Wilson & Dunn, 2004) suggests three main aspects of Freud's model of the unconscious that are distinct from more recent understandings of the unconscious: the reasons why the unconscious is unconscious, its nature, and its accessibility. In Freud's writings, mental processes are unconscious because of repression, the unconscious is merely "a repository of the primitive, infantile drives and desires" (Wilson & Dunn, 2004, p. 499), and the individual can access their unconscious mental states during psychoanalysis. Ultimately, Freud's version of the unconscious has been considered so complex and meandering that it has been difficult to extract hypotheses to test (Uleman, 2005, p. 5, cf. Kihlstrom, 1987, p. 1638). Nevertheless, Freud did argue for the power of the unconscious in everyday life, which has inevitably paved the way for modern theories of the unconscious, discussed later, such as the *cognitive unconscious* (Kihlstrom, 1987, see Section 3.2.5) and *the new unconscious* (Hassin, Uleman, & Bargh, 2005, see Section 3.2.5).

Another early conception regarding the limitations of consciousness was that of the behaviorists (e.g., Skinner, 1938; Watson, 1913), who argued that while the mind might have some role to play in predicting behavior, only behavioral responses to stimuli could be measured in a consistent manner. With the advent of the cognitive revolution, the study of consciousness burgeoned, accompanied by the gradual unearthing of its limits and the power of the unconscious.

3.2.2 We Often Tell More Than We Can Know

In the 1970's, questions arose regarding social psychologists' justification in asking participants about the reasons for their behavior, choices, and evaluations (for a review, see Nisbett & Wilson, 1977). Cognitive psychologists Mandler (1975), Miller (1962), and Neisser (1967) had controversially proposed that "we may have no direct access to higher order mental processes such as those involved in evaluation, judgment, problem solving, and the initiation of behavior" (Nisbett & Wilson, 1977, p. 232). While this claim stemmed from work

on the relatively automatic processes underpinning perception and memory, more research was required to justify generalizing such claims to social psychology, where much self-report research depended (and still does) upon the assumption of introspective access. Reviewing work on cognitive dissonance, attribution, subliminal perception and complex judgment tasks, Nisbett and Wilson's (1977, p. 233) seminal research on self-reports argued there was indeed evidence that individuals are often unable to accurately account for factors impacting on their responses.

For example, in a study carried out by the authors, participants were provided a list of word pairs to memorize. Interested in whether participants were aware of influences on their associative behaviors, the researchers provided some participants with pairs that were meant to activate associations with desired words that could then be elicited in participants' responses during a later word association task. The critical word pairs that participants were asked to memorize in the first task contained words such as "ocean" and "moon". In the subsequent standard word association exercise, the experimenters provided participants with probe words (i.e., "Detergent") and asked the participants to utter the first word that came to their minds. They found that the words they had intentionally semantically cued (target words, i.e., "Tide") were twice as likely to be uttered by the participants who had been exposed to the critical word pairs. When asked about what influenced their responses, participants provided reasons such as "My mother uses Tide", or "I like the Tide box" (Nisbett & Wilson, 1977, p. 243), with *only a third* of participants, when *directly asked*, ceding that the word pairing memorization may have been a possible influence.

Nisbett and Wilson found similar instances in a wide range of social psychological research, including their own work examining positioning effects and reported reasons for product appraisal (Nisbett & Wilson, 1977), and even in Latané and Darley's (1970) classic bystander effect, wherein participants were unaware of the effect that the presence of a greater number of bystanders had on their helping behavior. Nisbett and Wilson concluded from such studies that participants' self-reports were *often inaccurate* in three different ways: participants were strikingly unable to report accurately that an influential

stimulus existed (i.e., Nisbett & Schachter, 1966), that they were responding to this stimulus (i.e., Valins & Ray, 1967), or that these processes were even occurring (i.e., Bem & McConnell, 1970).

The consistent inaccuracy of participants' self-reports led Nisbett and Wilson to question where participants were actually drawing self-reports from, if not from direct introspection. One answer came in the form of Tversky and Kahneman's (1974) representativeness heuristic, by which "a particular stimulus will be deemed a representative cause if the stimulus and response are linked via a rule, an implicit theory, a presumed empirical covariation or overlapping connotative networks" (Nisbett & Wilson, 1977, p. 249). In other words, the often-inaccurate reports implied that participants' (strongly held) beliefs were not the product of awareness or memory of some internal process, but *a priori* theories linking stimuli and responses (Nisbett & Wilson, 1977, p. 233).

Participants were assessing a situation and reporting what might be a plausible reason for their behavior. Support for this reasoning came from studies in which observers not participating in a situation were asked to give reasons for the behavior of those actually participating. The studies showed that the observers' predictions were identical to reports provided by participants, challenging the assumption that the latter possessed some introspective access that could be called upon in their self-reports (Nisbett & Bellows, 1976).

According to Nisbett and Wilson, not only is there considerable evidence that individuals are poor at (accurately) reporting reasons for their behavior, there is actually a very good reason. As human beings, we have built up a store of experience of causal connections between events. When asked to report the reason for our own behavior, we use that experience. Hence in the study by Latané and Darley (1970), in which a greater number of bystanders reduced one's own likelihood of helping in an emergency, participants were unlikely to say "the reason I didn't help was because there were so many other people around" when much more plausible and personally defensible reasons such as "I was too busy" were available. Translating the evidence from studies reported by Nisbett and Wilson (1977), when asked about their achievement goals, learners can be argued to base their self-reports on *post hoc* rationalizations of

their achievement behavior, rather than direct introspection and accessing of the goals that directed it.

3.2.3 Our Experience of Conscious Will as Causal is an Illusion

Consciousness is a much smaller part of our mental life than we are conscious of, because we cannot be conscious of what we are not conscious of...How simple that is to say; how difficult to appreciate! It is like asking a flashlight in a dark room to search around for something that does not have any light shining upon it. The flashlight, since there is light in whatever direction it turns, would have to conclude that there is light everywhere. And so consciousness can seem to pervade all mentality when it actually does not.

(Jaynes, 1976, p. 23)

A further collection of challenges to the assumption that achievement goals are conscious and accessible comes in the form of Daniel Wegner's book *The Illusion of Conscious Will*. Here, Wegner examines what the fruits of psychological research can contribute to addressing the debate surrounding our ability to control or consciously will our actions. This leads him to discuss not only the delicate links between brain, mind, thoughts and actions, but also how they interact to create the *illusion* of a causal link.

3.2.3.1 Theory and Empirical Findings

3.2.3.1.1 Separating the Action from the Experience

The crux of Wegner's argument is the difference between the causal force generating our actions and the consciously experienced feeling of willing those actions into being. The idea of conscious will conceived as separate from the cause, force or motor setting the action in motion, and construed instead as an *experience*, dates back to Hume's (1739) understanding of it as the "personal conscious feeling of...causing, forcing, or motoring" (Wegner, 2002, p. 3). Conceptualizing the causal force and this *feeling* of doing (Ansfield & Wegner, 1996) as distinct requires that even though there may be occasions on which

both might be present there must also be occasions on which one is present in the absence of the other. One way of illustrating such a distinction is in instances where the experience of will is absent where the action is, at least observably, present. In these situations, actions would be said to occur unaccompanied by the conscious feeling of doing. Table 2 below provides the combinations suggested by Wegner as highlighting the possibilities for when causal force and experienced feeling of doing are conceptualized as distinct.

Table 2. Conditions of human action

	Feeling of Doing	No Feeling of Doing
Doing	Normal Voluntary Action	Automatism
Not Doing	Illusion of Control	Normal Inaction

Note. Adapted from Wegner (2002, p. 8).

Here “normal” experiences are illustrated by the downward, left to right diagonal. Having a feeling of having done something and seeing the action realized results in the least controversial condition of human action, that of *normal voluntary action*, just as not feeling as if one has done something and then not seeing any consequent action represents the opposite, *normal inaction*. However, research suggests the existence of more controversial experiences. These experiences fall under the upward, left to right diagonal, and are indicative of instances illustrating the separation between action and feelings of doing.

Feeling as if one has done something even in cases where they cannot possibly have had control breeds the *illusion of control* (Langer, 1975), as observed in Nielson’s (1963) mirror box experiment and in Wegner and Wheatley’s (1999) *I Spy* experiment. In Nielson’s (1963) experiment, a box was modified through the placement of a mirror within it, as shown in *Figure 3*.

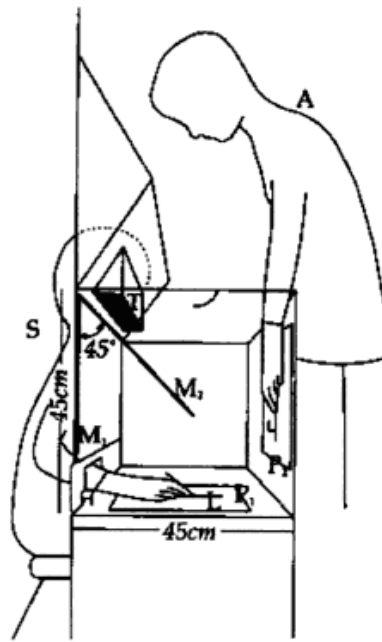


Figure 3. Set up of Nielson's (1963) mirror box

Note. Adapted from Wegner (2002, p. 42).

When individual participants (*S* in *Figure 3*) were asked to put one of their hands, gloved and holding a pen, into the box, a research assistant (*A* in *Figure 3*), also gloved and holding a pen, inserted their hand into the box. The mirror in the box (*M₂* in *Figure 3*) showed the participant the hand of the assistant rather than their own. This set up so convinced individual participants that the actions of the research assistant were those of their own hand that they corrected their arm when the line they had been asked to draw, moved by the research assistant, drifted from the instructions. This experiment showed that it is possible to feel as if an action is consciously willed when that action is similar to what one is consciously engaged in, even if the observed action departs slightly from the intended movement, and importantly, even if another is carrying out that action.

In Wegner and Wheatley's (1999) *I Spy* experiment, participants worked in pairs with a confederate in a more elaborate version of a Ouija board set up, as shown in *Figure 4*.



Figure 4. Set up of Wegner and Wheatley's (1999) *I Spy* experiment

Note. Adapted from Wegner and Wheatley (1999, p. 488).

They were asked to jointly move a mouse across a computer screen depicting an image from an *I Spy* book with around fifty objects. Participant and confederate were given divergent input via headphones as to where to pause the mouse, and every time the mouse stopped, mark on a continuum the extent to which they felt they had intended to stop in that location or had allowed their partner (the confederate) to stop there. Wegner and Wheatley found that the participants provided high intentionality ratings even when the confederate was in control of the mouse; participants even professed, during post-experimental interviews, that they had felt they were searching for an item at times. These studies underline the possibility of experiencing the feeling of doing even when another causes the action.

Wegner suggests that *automatisms*, in which one has no conscious feeling of doing, and yet an action results, represent a further controversial separation between a causal force and the experience of the will. Examples of automatisms include alien hand syndrome and the highly fashionable 19th century spiritualist activity of table-turning. Patients who experience alien hand syndrome feel as if one of their hands acts of its own accord. This condition is suggested to have its roots in damage to a specific region, the middle of the frontal lobe, on the

opposite side of the brain to the hand affected (Gasquoine, 1993). The ‘alien hand’ is sometimes experienced as behaving without any particular willing on the part of the patient, whereas at other times, it is even more alien in that it moves counter to the consciously experienced will of the patient. In these patients, action can be observed, but the feeling of willing that action is absent, again showing a separation between causation and experience of will. With 19th century table-turning (Ansfield & Wegner, 1996), a popular parlour activity, people would sit around a table, each with two fingers of each hand lightly pressing upon the table in front of them. When the table began to turn, the group would think a spirit was moving the table. Given that it would require more than one person to turn the table using their finger tips, the experience of consciously willing the table to move was relinquished. When Faraday (1853) ultimately tested the phenomenon of the turning tables, with a device measuring the origin of the force, he found that the tables were turning as a result of the combined activity of the people sitting around it, rather than an interested spirit.²⁰ In both of these situations, even though the individuals involved have caused the action, the experience of willing it has been absent.

3.2.3.1.2 Problematizing the Normal

Having provided examples of situations in which causation and experiences of the conscious will are separated, Wegner’s argument also takes issue with the *normal* diagonal of Table 2 (e.g., ‘normal voluntary action’ occurring when the feeling of doing is accompanied by doing; ‘normal inaction’ occurring when no feeling of doing is accompanied by not doing). More than just providing two examples of human action in which combinations of actions and feelings of doing seem to break away from the normal and suggest distinct underlying mental systems, Table 2 illustrates which aspects of human action Wegner posits as being *illusions*. For Wegner, the entirety of the column entitled *Feeling*

²⁰ Wegner (2002, p. 8) adds that this could even be shown through the simple method of using a dusty table, with the hypothesis that if the table was moving of its own accord (or that of a spirit), the finger marks on the table would be in the opposite direction to the way it turned. This would indicate that their fingers stayed still while the table moved, yet it was more likely that finger marks would be consistent with the direction of the table movement, suggesting that the individuals seated around it had collectively moved it, even if they had experienced no feelings of personal causation due to acting as a group.

of Doing (e.g., feeling of doing accompanied by either doing or not doing), is an illusion as causation and the experience of conscious will are always separate. This is supported empirically by studies on brain stimulation and finger movement, and theoretically in terms of the conditions that need to be in place for us to experience the feeling of consciously willing an action.

If 'normal' human action involves feeling as if one has done an act and then witnessing the act being done, Penfield's (1975) brain stimulation research indicates that while it is possible to stimulate the motor structures in a brain so that an individual indeed makes and witnesses certain actions, these actions will not feel willed to them. In Penfield's study, participants were given a local anaesthetic prior to open head surgery. Penfield had mapped a series of actions onto the brain surface. When he stimulated these sections and both he and the participants themselves observed the participants' actions, participants remarked that Penfield had caused them, rather than that they had intended them, even though their brains had caused the actions. While it could be argued that participants considered the outside stimulation as inconsistent with their own having caused the actions and were thus unlikely to remark that they themselves had caused them, Penfield's research does suggest that the locations of those parts of the brain that are involved in the mental causation at least on the level of physical movements are different and independent from those that involve the creation of experiences of conscious will. In other words, mental causation and the experience of conscious will represent anatomically distinct components.

Further to a physical separation between the cause of action and the experience of a feeling of doing, research conducted by Libet and colleagues (Libet, 1985; Libet, Gleason, Wright, & Pearl, 1983) suggests that these different processes may even occur at different times. Libet's research is based on the ideas of *readiness potential* and *movement potential* originally explored by Kornhuber and Deecke (1965). Kornhuber and Deecke asked each of their participants to voluntarily move their right index finger whenever they liked, while the researchers explored the electrical activity in each participant's brain and finger. This was done by measuring electrical potentials on the participant's scalp (electroencephalography, EEG) and electromyography (EMG) of their

finger muscles throughout the experiment, in which each participants moved their finger about a thousand times. Kornhuber and Deecke found that each time participants did this, the act was preceded at about 0.8 seconds by increasing electrical activity in the brain. This activity peaked at about 0.09 seconds before the visible action, before decreasing again. This readiness potential then translated at about fifty milliseconds before the action into a movement potential (Deecke, Scheid, & Kornhuber, 1969), a “more localized activation responsible for the specific action just as the action unfolds” (Wegner, 2002, p. 50). While Kornhuber and Deecke’s (1965) study seemed to suggest that these potentials represented an operationalization of the conscious willing of the finger movements, it did not actually provide any information as to whether this was the same moment that participants were aware of willing their finger to move. As a result, Libet and colleagues (Libet et al., 1983) decided to explore what would happen if they asked participants directly to indicate the moment when they decided to move their finger.

Again, participants were prepared for EEG and EMG, and instructed to raise their right index finger whenever they wanted. Yet this time, Libet and colleagues (1983) asked the participants to, using a more complex version of a clock face, point out the exact location of a moving dot that operated as a clock hand. They were asked to point out location of the dot the moment they consciously willed the movement of their right index finger, the moment they were aware of moving it, and the moment that the researchers applied a stimulus to their hand. This last request provided an estimate of the time it took for signals to be sent from the hand to the brain, and thus each of the other times took this process measure (about forty-seven milliseconds) into account and was accordingly corrected. Libet found that the order of action started with an increasing readiness potential at about five hundred milliseconds before the finger moved, which while occurring three hundred milliseconds later than that of Kornhuber and Deecke, was likely to have come from Libet’s explicit instructions to participants to ensure their finger movement was unplanned and spontaneous (Wegner, 2002, p. 54). This was followed by participants becoming consciously aware of willing the movement at about 157 milliseconds before the finger moved, and awareness of moving their finger at about forty milliseconds

before the finger actually moved. As such, the findings suggest that the action has already been initiated in terms of the brain readiness potential *before* the experience of consciously willing and moving the finger. This suggests that it is not the conscious will that begins the process of moving the finger, but that perhaps conscious will is something that comes in later, *during* the process.

Wegner's argument that conscious will is an illusion in normal human action is thus supported by the findings of both Penfield and Libet's research in that mental causation can be observed in the absence of feelings of conscious will and that mental causation, as represented by readiness potentials, can be considered to occur at a different time to the appearance of a feeling of consciously willing an action. Especially taking Libet's findings into consideration, if conscious willing occurs as a later part of the mental causation process, there must be occasions on which it does not form a part of the process at all. In other words, there must be situations in which mental causation occurs without ever activating feelings of conscious willing just as there are situations in which it is later accompanied by feelings of conscious willing. This begs the question of under what conditions a feeling of conscious will accompanies mental causation and under what conditions it might not. Wegner and Wheatley's (1999) Theory of Apparent Mental Causation provides some explanations.

3.2.3.1.3 The Illusion of Conscious Mental Causation

According to Wegner and Wheatley's (1999; Wegner, 2002) Theory of Apparent Mental Causation, experiencing feelings of having consciously willed actions requires that conditions of *priority*, *consistency*, and *exclusivity* are met. The *priority* principle posits that an action will be experienced as consciously willed by an individual when the thought of that action is followed by the action: some representation of the action must appear in the mind before it appears before their eyes for them to feel as if they have caused it to occur. Moreover, the thought must not occur too long before or after the action for it to be judged as causing the action. This provides the illusion that the thought has created the action. However, it is only an illusion because the thought itself, though experienced prior to the action, does not necessarily equate to the direct causal force behind that action. This reflects the logical fallacy *post hoc ergo propter*

hoc.²¹ As a result, we may “experience ourselves as agents who cause our actions when our minds provide us with previews of the actions that turn out to be accurate when we observe the actions that ensue” (Wegner, 2005, p. 23), but this does not mean that our conscious will necessarily induced those actions.

The principle of *consistency* posits that an action will be experienced as consciously willed by an individual when the content of their thought is reflected in the content of their action. Vallacher and Wegner (1985) argue that the thoughts we perceive as causal include “the name of the act, an image of the act, or a reference to its execution, circumstance, or consequence” (Wegner, 2002, p. 79). While Nisbett and Wilson (1977) also provide suggestions for why we are hesitant to concede authorship and ownership of our own actions, such that we are unlikely to report that we are, when asked, unwitting of the exact reasons for some of our action, Wegner reminds us that there are often occasions on which a great idea or solution to a problem arrives, effortlessly and fully-formed, into our consciousness. On these occasions, we are willing to admit the inconsistency of our thoughts with the actions. We do not know where these actions, words, or ideas have come from, and our experience of consciously willing them into existence is undermined given that we have had no prior, consistent previews of them. Either way, that a thought is consistent with an action does not equate to the thought causing the action.

²¹ It is also similar to Nisbett and Wilson’s (1977) notion of the origins of participants’ reports about the reasons behind their behavior. Here, participants’ reports are derived from reflecting on the action once it has been made, and can be accurate as to the cause of that behaviour, even though this accuracy does not come as a result of direct introspection. In the same way, the internal conscious thought process can be engaged in to determine the extent to which one feels as if they have consciously intended an action, and yet research on the location and timing of mental causation and the experience of conscious will suggests that it is not the thought itself that has created the behavior. Of course, behavior here may be motivated by either a conscious or a non-conscious force (e.g., make a conscious plan to dedicate the next two weeks to studying logical fallacies, or be unwittingly influenced by a competitive environment to try to overtake your peers), and thus reasons behind behaviors may sometimes be more possible to ascertain than others. However, the same claim, that for one to cause an action requires them to think about that action before it occurs, and for Nisbett and Wilson that this can be recalled and reported remains just that: the conscious experience with no direct causal control or ability for introspection.

The final principle is *exclusivity*. This is fulfilled when there is no other likely cause for the action. Feeling as if there is potentially another cause for the action will reduce the extent to which one feels as if they had consciously willed that action. Potential causes that might serve to increase or decrease exclusivity and feelings of conscious will include both internal and external causes. For example, individuals can be argued to attribute their actions to “emotion, impulse, disposition, or habit” (Wegner, 2002, p. 91), such that experiencing heightened emotion, being impulsive, deeming behavior as indicative of one’s unchangeable disposition or due to habit can lead to feelings that one has not consciously willed behavior enacted within the presence of these circumstances. External alternative causes may involve other individuals or groups or more otherworldly entities, such that one feels a reduced sense of consciously willing an action when that action may have been carried out in conjunction with another person or persons, such as in the *I Spy* experiment, or attributable to a supernatural force, as in 19th century spiritualist parlour game of table-turning. Again, deciding that there is no other likely alternative explanation than one’s thoughts regarding an action does not imply that one has consciously willed that action.

Ultimately, each of the three principles involves the comparison of the thoughts before the act and the observed action. If a thought occurring just *prior* to the action has a largely *similar content* and there seem to be *no likely alternative explanations* other than that thought being causal, an individual will tend to strongly experience that thought as a sign they have consciously willed the action.

3.2.3.2 Implications for Conceptualizing Achievement Goals

The previous sections have described some of Wegner’s elaborate argument distinguishing unconscious mental causation from the illusion of the experience of conscious will. In sum, unconscious mental causation has been shown not only to occur in an anatomically distinct location from feelings of conscious will in brain stimulation studies (Penfield, 1975), but also prior to the conscious experience of willing in the finger lifting studies (Libet, 1985; Libet et al., 1983;

Kornhuber & Deecke, 1965). Furthermore, the feeling of conscious will has been shown to occur even in situations where the individual has not carried out the action such as in the *I Spy* (Wegner & Wheatley, 1999) and the gloved hand, line-writing experiments (Nielson, 1963). According to the Theory of Apparent Mental Causation (Wegner, 2002; Wegner & Wheatley, 1999), feelings of consciously having willed an action will arise in situations where individuals have previews of the action just prior to the performance of the action, where the content of the thought is consistent with the action, and where a lack of potential alternative internal or external causes exists for the action.

Crucially, these latter experiences, as illusions, are at most an estimation of “the moment-to-moment...role that our minds play in our actions” (Wegner, 2002, p. 15), and not indicative of the “real causal sequence” (Wegner, 2002, p. 27). Methodologically, Wegner’s argument throws up the important question, *if individuals’ reports about their actions are supposedly based on the experience of consciously willing their actions, but conscious will is an illusion, whence are individuals drawing their reports?*

Take, for example, an individual who has performed an action. In accordance with Wegner’s argument, it may be the case that the individual will have experienced a feeling of consciously willing that action. Asking that individual, after the action has been performed, why they performed it is likely to result in an answer. Normally, it would be assumed that their answer would result from a process of introspection, the goal of which is to retrieve the memory of consciously creating the intention and then accomplishing the action.

However, the problem of causality inherent in our *inability* to “see [our] conscious intention causing an action” (Wegner, 2002, p. 13) implies that we are never able to do more than *infer* that our conscious intentions cause our subsequent actions. Thus conceptualizing the conscious will as a causal force “must always overreach what we can see (or even introspect)” (Wegner, 2002, p. 14). Hence, though the individual may form a conscious intention to perform an action, they are unable to claim with certainty that it was their intention that caused the action. In the same way, it could be suggested that while an individual may form a conscious achievement goal, they would be unable to

claim with certainty that it was their goal that caused the action. In sum, according to Wegner's arguments, asking an individual about their achievement goals may result in responses based not on introspection on the actual cause behind their behavior, but on a process of inference taking into account the principles of priority, consistency, and exclusivity.

3.2.4 We Can Nonconsciously Pursue Goals

At the beginning of this chapter, the following definition was offered for conscious mental processes: “mental acts of which we are aware, that we intend (i.e., that we start by an act of will), that require effort, and that we can control (i.e., we can stop them and go on to something else if we choose...)” (Bargh & Chartrand, 1999, p. 463). Till now we have examined a series of theories and findings that challenge the notion that our behavior is always directed by conscious awareness and intention and that we can explain our actions with accuracy. In this section, we consider work by John Bargh and his colleagues that challenges the notion that our behavior and cognitions are also always effortful and under our control.

3.2.4.1 Theory and Empirical Findings

The work of Bargh and colleagues relies in part on the concept of “limited conscious attentional capacity” (Bargh & Chartrand, 1999, p. 464). This concept originates in Baumeister, Tice and colleagues' (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven, Tice, & Baumeister, 1998) investigations of the detrimental effects on performing a second, minor self-regulatory act (e.g., avoid laughing while watching a funny movie) in an unrelated activity after participants have been asked to perform a first, also minor self-regulatory act (e.g., do not think about white bears). These observations regarding the limits to conscious attentional capacity suggest that because even small conscious self-regulatory acts use up this capacity, as little as 5% of our daily acts of self-regulation may occur consciously (Bargh &

Chartrand, 1999, p. 464). Thus the remainder – the majority – of our mental processing is implied to occur on a nonconscious, automatic level.²²

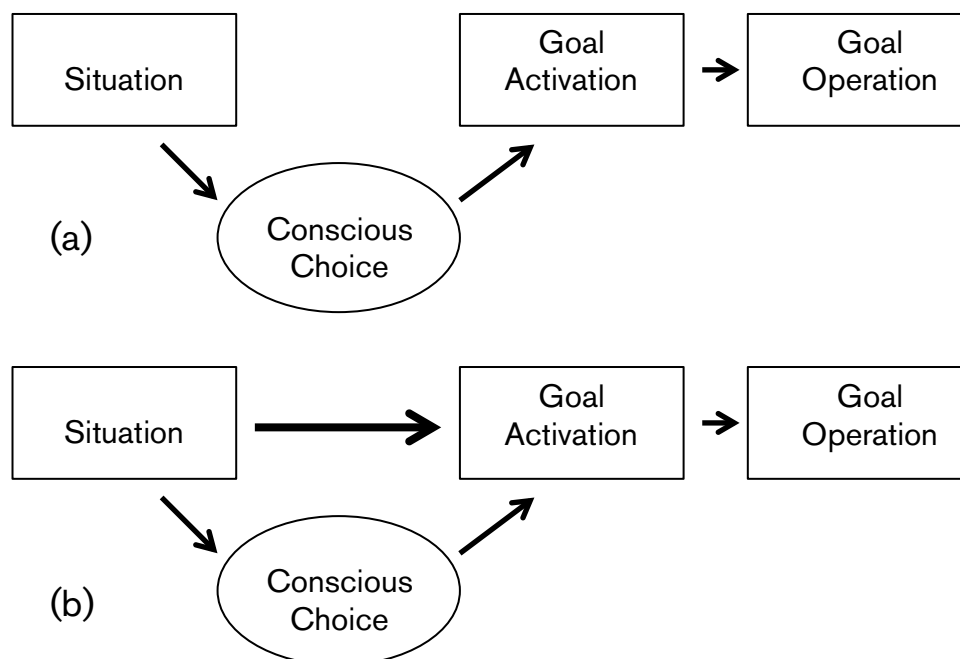


Figure 5. (a) Conscious, intentional mediation of goal pursuit within a situation and (b) Automatic activation and operation of goals by situational features following repeated choice of the same goal

Note. Adapted from Bargh and Chartrand (1999, p. 470).

According to Bargh and Chartrand (1999), this automatic behavior is the result of a larger process in which a specific situation is presented to the learner, a conscious choice is made regarding a response to that situational stimulus, and a goal or purpose is decided and then acted upon. With time, the *frequent* and *consistent* presentation of this situation or situations with similar features results in a bypassing *through automatization* of the conscious choice (Bargh, 1990), such that the effortless, unintentional, and unaware perception of the situation unconsciously activates the goal, its operation, and its fulfilment. The use of a self-report method in such a situation seems problematic. Importantly, this automatization, as illustrated in *Figure 5* (above), can be *intentionally* or *unintentionally* acquired.

²² While it could be argued that achievement goals would make good candidates for this 5%, the highly similar nature of many academic tasks would suggest the greater likelihood that conscious goal decisions are made in the presence of novel or extraordinarily challenging academic tasks (see Bongers, 2007), and are absent from the everyday achievement settings that achievement goal researchers are generally interested in measuring using self-reports.

The possibility for an unintentionally automatized conscious choice raises questions for achievement goals, such as when the conscious choice to adopt a certain goal is made, and whether students can remember or comment on if it was consciously made. Furthermore, in line with the model of how goals are cognitively represented, proposed earlier (see Section 2.1.5.2), this process of unintentional automatization of conscious choices could support the idea of intraindividual stability in terms of paths of activation among relevant nodes that are strengthened and more readily activated over time.

Using priming procedures, Bargh and his colleagues have been able to empirically examine this perception-to-action logic in the automatic, that is, the unintentional, effortless, and nonconscious, activation of various trait and stereotype-related behaviors. For example, Bargh, Chen, and Burrows (1996, experiment 1) primed one group of their participants using words linked to the trait of politeness, such as *cordially* and *considerate*, another group with words linked to the trait of rudeness, such as *bother* and *obnoxious*, and did not prime the last group, who acted as a control for the other two conditions. When participants had completed the priming task, the researchers sent participants down a corridor to what they thought was the next experiment. They were told that they would meet the researcher in charge of that experiment at the end of the hall. When they reached the researcher (a confederate), however, this individual was engaged in a conversation. Here the differentiation among the groups was revealed: 67% of those primed with words linked to the trait of rudeness interrupted the researcher's conversation, as compared to 38% of those in the control group, and only 16% of those in the politeness condition.

In a second experiment, Bargh, Chen, and Burrows (1996) found that priming students with words stereotypically associated with the elderly, such as *sentimental* and *wrinkle*, led participants to walk more slowly down a corridor after what was presented as the end of the experiment than students who had not been primed with such words. In both experiments, when asked, the participants were unaware of the primes and of their influence on their behavior. The mental representations of the traits of rudeness and politeness and the stereotypes surrounding the elderly could be activated outside of the individuals' conscious awareness, direct their behavior without their conscious

effort, control, or an act of will, and leave the participant unable to account for what had just happened. Bargh has argued that priming traits and stereotypes using words in the laboratory can be compared to similar priming, albeit by situational cues, outside of the laboratory and that this demonstrates an *environment to perception to behavior* link (Bargh & Chartrand, 1999).

Bargh and colleagues acknowledge that everyday behavior is often goal-directed, and thus have extended their experiments to explore the role of goals within this link. Bargh (1990) has argued that if we conceive of goals as mental representations, then as with other mental representations they should be capable of being activated by the environment. If goals can be automatically activated by the situational cues present in everyday settings, it should also be possible to automatically activate goals in a laboratory setting, with the now clear implications for self-report.²³ Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel (2001) found that such automatically activated goals share key characteristics of general goal pursuit, namely “vigorous acting toward goal attainment, persistence in the face of obstacles, and resumption after disruption” (Bargh et al., 2001, p. 1016). For example, in their fourth experiment, they attempted to prime the *behavioral* goal ‘to achieve’ in some participants and not others, and found that when participants were asked, via intercom, to stop working on an activity in which they were given two minutes to find and note down as many words as they could using a set of Scrabble tiles, 57% of those who had been primed with the achievement goal, as opposed to only 22% of the control group, continued working so as to obtain a higher score.

In an experiment examining *cognitive* goals, Chartrand and Bargh (1996) found that unobtrusively exposing participants to synonyms of either the word ‘memorization’ or ‘evaluation’ in a first activity led them to adopt these goals for dealing with a set of unrelated information presented to them later on. This replicated, albeit with *implicit* primes, the results of Hamilton, Katz and Leirer (1980), where participants who had been explicitly asked to follow an

²³ These are, of course, that if goals are automatically activated, and an individual is asked the reason for their behavior, their lack of awareness, control, effort, and intention should lead to their response being comprised of *post hoc* rationalizations.

impression-formation goal not only remembered more of the material but also gave evidence of having better organized the information in their memory than those instructed to memorize the material (Bargh & Chartrand, 1999, p. 469). Again, in both of these experiments, participants were unaware that they held these goals and yet, from their behavior, had evidently acted on them.

These results suggest that it is possible to nonconsciously activate goals and that nonconscious goals share key characteristics with consciously held goals. The similarities go further. Gardner, Bargh, Shellman, & Bessenoff (1999) investigated brain activity for conscious and nonconscious evaluation goals and found that the same structures involved in consciously willed evaluation goals are activated when goals are nonconsciously activated by the environment (i.e., increased activation of the basal right hemisphere at 650ms after presentation of stimulus). Chartrand (1999, experiment 1) has shown that the pursuit of nonconscious goals is also similar to that of conscious goals in terms of accompanying affective effects: priming some participants with the goal 'to achieve' and then inducing success or failure led to expected respective changes in primed participants' mood and self-efficacy beliefs but not in those of the control participants. Again, primed participants were unable to account for these changes.

3.2.4.2 Implications for Conceptualizing Achievement Goals

These experiments suggest that goals can become automatized processes to limit cognitive overload, and can guide cognitive and behavioral responses outside of conscious awareness and control, effortlessly, and without an initiating act of will. Even unwitting perception of specific environmental factors can trigger goal adoption, with the same neurological, behavioral, and affective effects as intentional, consciously held goals. Because the process of automatization itself is automatic, goals may become automatic and activated in situations without our awareness that this has occurred (Bargh & Chartrand, 1999, p. 469). The implication is that our capacity to comment on such goals is *seriously* undermined.

Just as in Nisbett and Wilson's (1977) work, in each experiment, Bargh and his colleagues probed participants after they had outwardly pursued the implicitly primed goals, as indicated by the researchers' dependent measures, and found them entirely unaware of having done so (Gollwitzer & Bargh, 2005, p. 633).

These studies directly challenge assumptions that goals are always conscious and accessible. When such research is placed alongside common achievement goal methods that rely heavily on these assumptions, goal theorists must begin to acknowledge the implications conceptually and methodologically.

3.2.5 The Cognitive Unconscious and the New Unconscious

As mentioned in Section 3.2.1, the presently considered model of nonconscious goal pursuit is distinct from the environmental stimulus-response model of the behaviorists; here the environmental/situational cues result in behavior *via* nonconscious goals.²⁴ This reflects the more recent models of the unconscious that appear in Kihlstrom's (1987) article entitled *The Cognitive Unconscious* and in Hassin, Uleman and Bargh's (2005) more recent edited volume, *The New Unconscious*.

In his seminal 1987 article, Kihlstrom compared the classic information-processing model for human cognition with the development of more recent models such as Adaptive Control of Thought (ACT) and connectionist or Parallel Distributed Processing (PDP), remarking that such later models allowed for the conceptualization of a more potent, and importantly, cognitive, unconscious. The classic model had allocated to the unconscious only those "unattended percepts and unretrieved memories...[that] make no contact with higher mental processes, and thus cannot influence conscious experience, thought, and action" (Kihlstrom, 1987, p. 1446), whereas the more recent models were compatible with the findings of research on automatic processes, subliminal perception and priming, implicit memory, and hypnosis. Indeed,

²⁴ In line with William James's (1890, see also Berkowitz, 1984) conception of ideomotor action, Carver, Gannellen, Froming, and Chambers's (1983) behavioral schema notion helps to explain how priming works, in that "activation will spread automatically from the interpretive to the behavioral schema" (Bargh, Chen, & Burrows, 1996, p. 233).

these findings seemed to suggest that the majority of mental processes are occurring unconsciously. Hence, Kihlstrom defined the cognitive unconscious as “mental structures and processes that, operating outside phenomenal awareness, nevertheless influence conscious experience, thought, and action” (1987, p. 1445). Within this conceptualization, consciousness is associated with processing that is “slow and sequential” (Kihlstrom, 1987, p. 1446), while perceptions of the environment are thought to activate

preexisting semantic memory structures corresponding to the features of the stimulus event, as well as related nodes by virtue of spreading activation. If some of these nodes correspond to the goals and conditions of various production systems, certain procedures will be executed as well...[without] the involvement of working memory. (Kihlstrom, 1987, p. 1448)

In terms of achievement goals, conscious achievement goals would represent slow and sequential processing, whereas nonconscious achievement goals would operate quickly via spreading activation, reflecting the model of how achievement goals are cognitively represented proposed in Chapter 2 (see Section 2.1.5.2) and also Bargh and colleagues’ (e.g., Bargh & Chartrand, 1999) finding that goals can be automatically activated by situational features. Importantly, the lack of involvement of the working memory suggests that goals operating as nonconscious, automatic processes would be inaccessible via self-report methods.

Hence already by the late 1980’s, the conception of the unconscious was beginning to theoretically shift toward acknowledgment that more cognitive processes could be carried out without the need for conscious initiation, control, effort, and attention. Furthermore, empirical findings were beginning to show that such processes could indeed influence our thoughts and behavior. *The New Unconscious*, edited by Hassin, Uleman, and Bargh (2005) almost twenty years following Kihlstrom’s article, emerged at a point in time where the power of the unconscious in psychology is not only acknowledged but accepted as a premise for further exploration. This volume brings together recent empirical work that expands the number of unconsciously operating cognitive

processes. It includes research on implicit working memory (Hassin, 2005), unintended counterfactual thinking (Roese, Sanna, & Galinsky, 2005), and even unconscious self-regulation through implementation intentions (Gollwitzer, Bayer, & McCulloch, 2005), and suggests a new unconscious, which “is much more concerned with affect, motivation, and even control and metacognition” (Uleman, 2005, p. 6) than Kihlstrom’s cognitive unconscious could have predicted. Crucially, this conception is new not only in comparison to previous conceptualizations of the unconscious; it is also new in that the field is still “partial, developing” (Uleman, 2005, p. 14), and will require a wealth of continued research to further clarify current findings and their implications.

3.2.6 Section Summary

The previous sections have reviewed just a few of the many persuasive findings regarding the power of the unconscious, and explored the strong implications regarding the mental representation, process of activation and pursuit, and capacity for accessing and commenting on achievement goals. These sections have shown how the concept of the unconscious has developed from a philosophical possibility to the Freudian to the behaviorist through to the empirically grounded new unconscious that has emerged from explorations of consciousness originating in the cognitive revolution. As these studies have amassed, researchers have unearthed several key findings regarding awareness, acts of will, effort and control. We are often *unaware* of the reasons for our behavior: we fail to recognize a stimulus, our response to it, or even that this process has occurred. An act of conscious *will* is unnecessary in the initiation of behavior; the environment can set cognitive goals and behavior in motion, and the conscious will is at most an accompanying experience or feeling rather than a causal force. Behaviors and cognitions can occur *effortlessly*, as when they are activated outside of our conscious awareness and run their course. Furthermore, if one is unaware of the activation and process occurring, the element of *control* over the process disappears. When we respond to questions asking us about the reasons behind our behavior, we provide *post hoc* rationalizations based on inferences.

The next section of the chapter explores the extent to which these findings have been considered within the motivation literature, and where possible, the response from achievement goal researchers.

3.3 The Unconscious and Achievement Goals

As illustrated in Chapter 2, the vast majority of achievement goal studies rely on self-reports in their assessments of students' achievement goals, either in the format of questionnaires, interviews, or through manipulation checks of experiments. The use of such methodology implicitly assumes that achievement goals are conscious and therefore can be accessed. However, up till now, this chapter has presented key findings from literatures on the unconscious that suggest individuals' complex cognitive goals can be activated and fulfilled, influencing behavior and cognitions, *without* an initiating act of conscious will, awareness, effort, or control, and leaving the individual unable to recognize or comment on the fact that this process has occurred. This section explores the extent to which these findings have been considered and even addressed within achievement goal research.

In 1984, Nicholls wrote about Dennett's (1978) intentional conceptions of behavior, likening an achievement goal perspective to this way of understanding the predictability of behavior based on the assumptions of goal-directed behavior and rational means towards attaining those goals. Interestingly, he states at this early point in achievement goal theorizing that such an intentional conception of behavior "does not imply that individuals are always conscious of their goals" (Nicholls, 1984, p. 40). In spite of this, much achievement goal research has relied on self-report and implicitly assumed the consciousness and accessibility of achievement goals.

In 2000, Murphy and Alexander conducted a review of motivation terminology from a useful outsider's perspective, and discussed the issue of accessibility. One of their findings was that there were fewer studies on younger children's motivation. The reviewers suggested that this might stem from an assumption within the field that younger individuals might lack the ability to reflect and articulate such concepts when asked (Murphy & Alexander, 2000, p. 32). Given the findings discussed in the previous section, this could be extended so that it

would apply not only to younger children, but also to all who are asked to report on their achievement goals. At the adult level, Murphy and Alexander's (2000) review of the motivation literature did not reveal much explicit discussion of accessibility at all. The reviewers interpreted this to be a result of researchers having made the assumption that their participants' motivations are conscious and accessible, and therefore not needing to explicitly discuss it. However, the reviewers often found the phrases learners' "beliefs" or "perceptions" (Murphy & Alexander, 2000, p. 38) accompanying self-reports, and took these to represent the acknowledgement of motivation researchers that human access to motivational mechanisms might be limited (Murphy & Alexander, 2000, p. 39).

A prominent achievement goal theorist, Pintrich (2000) replied directly, addressing and clarifying the issue of accessibility from an achievement goal perspective. In his reply, Pintrich distanced goals from unconscious constructs such as motives or needs, and emphasized (Pintrich, 2000, p. 96, as have others, see Lemos, 1996, p. 151; Elliot & Fryer, 2008) that as goal theory stems from the cognitive revolution, it inherits the associated assumptions: goals are assumed to be cognitively represented in ways that are consciously accessible. Pintrich highlighted these reasons as an explanation for Murphy and Alexander's (2000) limited findings of the explicit discussion of conscious accessibility, and suggested that Murphy and Alexander's (2000, p. 37) questions regarding the accessibility of motivation were therefore irrelevant to the valid operationalization of goals (Pintrich, 2000, p. 96).

Each of these three claims can be addressed in turn. In terms of distancing goals from motives or needs, it is important to note that authors such as Nisbett and Wilson (1977) only use 'motive state' in line with developments in motivation research up until the time of writing, whereas Murphy and Alexander (2000) use it because their review is not only limited to achievement goal research. In fact, as the first section of this chapter showed, much more recent research on the unconscious suggests that it envelops a greater range of constructs than just motives or needs, including cognitive and behavioral goals. Secondly, goal theory has indeed emerged from the cognitive revolution, but so has the research on the limits of consciousness. Thirdly, the findings of research

originating in the cognitive revolution have suggested that the very fact that goals are cognitively represented *enables* them to be nonconsciously activated, for example by patterns of spreading activation, such that they are not always consciously aware and hence not always accessible. The concerns, therefore, remain.

In a later piece, Elliot and Fryer (2008) seem to agree with Pintrich. They argue that a significant aspect of the definition of goals is that they are *consciously committed to*, and that such commitment *begins with conscious intention* (Elliot & Fryer, 2008, p. 246), which the previous section of this chapter has queried. However, they simultaneously refer to research conducted by Bargh and his colleagues (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001) on automatic processing, ceding that “once in place in the cognitive system, goals may be activated and may operate in a thoroughly automatic, nonconscious fashion” (Elliot & Fryer, 2008, p. 246). This claim is made without discussion of its implications. When and how often, for example, must such goals be consciously committed to, in order to become part of the cognitive system and from then on operate automatically? Is it every time that a new task is provided in an achievement setting or can goals that have previously been activated for similar tasks become automatically activated given similar environmental conditions? Can learners access these automatic, nonconsciously activated goals, and report on their activation and adoption within everyday achievement settings? Acknowledging research findings on automaticity is interesting here not only given the implications of Bargh and colleagues’ many findings for the continued use of self-report measures in achievement goal research, but considerably more so in terms of the centrality of especially Elliot in producing achievement goal self-report measures, coupled with the *sustained absence* of automaticity from the definition and measurement of achievement goals.

More recently, researchers within achievement goal theory have begun to acknowledge findings on the unconscious. Pintrich and Elliot have both suggested that exploring the unconscious is a worthwhile avenue of scholarship for achievement goal researchers. For example, in 2003, Pintrich outlined what a motivational science perspective to studying student motivation might look like, and highlighted as one of seven substantive questions facing motivational

science researchers, *do students know what they want or what motivates them?* In this article, Pintrich cites work not only on implicit motives and unconscious needs, but also the work of Bargh and colleagues on behavior directed by nonconscious goal pursuit, remarking that this latter type of behavior “resonates with anyone who has observed students in many classroom situations where they seem to proceed in rather habitual and unreflective ways” (Pintrich, 2003, p. 678). Pintrich recommends that achievement goal researchers take care to explore the interactions between implicit and conscious processes, rather than pitting them against each other (p. 678). In a 2012 review of achievement goal theory, Murayama, Elliot, and Friedman interestingly claim, “few present-day achievement goal researchers would argue that all goals are consciously accessible” (p. 201) but do cede that this is not entirely apparent when considering how achievement goals are operationalized. These authors also cite the work of Bargh and colleagues and that of Custers and Aarts (2005) on nonconscious goal pursuit, emphasizing that there is a “strong need” (Murayama, et al., 2012, p. 202) for research in “disentangling conscious and nonconscious elements of achievement goal striving, thereby bringing a richer understanding to the field as a whole” (*ibid.*). The recommendations proffered by Pintrich (2003) and Murayama, Elliot, and Friedman (2012) are thus encouraging not only in their acknowledgement of the strength of findings on the role of the unconscious, but of their willingness to see it explored in terms of achievement goal pursuit. Such a program of research requires a dedicated methodology, with a mix of current methods and the development of more implicit ones that might be able to tap into nonconscious achievement goals. Suggestions for just such a methodology are proposed in the next section.

3.4 Implicit Methods

Achievement goal researchers who acknowledge the power of the unconscious have recommended the study of the interplay between conscious and unconscious goals. The methods for studying conscious achievement goals have been considered in depth in Chapter 2, so this section focuses mainly on several methods that could either access unconscious constructs or aid in comparing them with conscious constructs. As such, the following subsections

discuss the Thematic Apperception Test, the Implicit Relational Assessment Procedure, Trace Measures, Priming, and the Implicit Association Test, and the appropriateness of such methods in exploring nonconscious achievement goals.

3.4.1 The Thematic Apperception Test

As mentioned in the beginning of Chapter 2, one of the earliest implicit methods was the Thematic Apperception Test (TAT, Morgan & Murray, 1935), famously used by McClelland, Atkinson, Clark, and Lowell (1953) in their work on the achievement motive, and recently reconceptualised in the form of Picture-Story Exercises (PSEs, Thrash, Maruskin, & Martin, 2012). This projective test involves presenting participants with ambiguous picture cards and asking them to tell stories about the pictures. Participants' descriptive stories about the pictures are thought to reveal details of their current conscious or unconscious states, and the use of projection is argued to decrease the likelihood that respondents will use self-presentation strategies. Consequently, these measures were deemed appropriate for capturing implicit motives (McClelland, Koestner, & Weinberger, 1989), which were theorized to be inaccessible to self-report (e.g., Feather, 1961; McClelland & Liberman, 1949; Veroff, Wilcox & Atkinson, 1953).

Developing a TAT-like test for achievement goals could involve the design of images of achievement-related situations. These could be entirely ambiguous, thereby allowing for even non-goal-responses, or designed so that specific elements visually embody the theorized distinctions between achievement goals (performance and mastery) and valences (approach and avoidance). An example scene of the latter type could depict a classroom, in which several events are occurring simultaneously. In the centre of the image, there might be a student scratching her head, who could be interpreted as looking worried or concentrated. Nearby might be a pair of students, one working diligently and the other looking at their peer's work. Such an image might evoke stories about

task-, self-, and other-based referents, activated by the presentation of an achievement setting.²⁵

This method could provide interesting findings regarding the experiences activated in the participant by the presentation of an achievement setting. It would provide space for the participant to indicate those aspects most salient to them; in this way, their achievement experience would be explored holistically, and goals might actually feature less prominently for some than others. Hence, there is the benefit of holistic exploration balanced with the potential that participants might not even mention achievement goals, which could be considered antithetical to the entire programme of ascertaining an individual's goal approach via this method.

There are also certain lessons to be gleaned from the use of the TAT that impact on whether it represents an appropriate exploratory candidate for capturing nonconscious achievement goals. In use, findings from the TAT have seldom correlated with self-report measures aimed to assess explicit achievement motives. This divergence alone is not problematic, but its interpretation has been. McClelland and colleagues' (McClelland, Koestner, & Weinberger, 1989) reaction was to argue that explicit, self-attributed motives were statistically independent from implicit motives. This was theorized to be a result of the different nomological networks of each type of motive, wherein implicit motives "appear to develop in early childhood through preverbal, affect-based associative learning, respond to task-based or experiential incentives, predict spontaneous behavior trends, and are introspectively inaccessible" (Thrash, Maruskin, & Martin, 2012, p. 143) in contrast to explicit motives that are "thought to develop later in childhood through verbally mediated learning, are responsive to social-extrinsic or verbal-symbolic incentives, predict deliberate choices, and are accessible in the form of consciously articulated values" (*ibid.*). Others interpreted the lack of correlation as implying that one of the methods

²⁵ This method could also be tried with eye-tracking: where the participant fixates could provide clues as to the salience of these elements of the image to the participant's experience of an achievement setting. However, of course, salience does not equate to the goal that the participant might pursue in an achievement situation; for example, salience could also imply a concern, and thus using eye-tracking would require careful operationalization.

was invalid, and this has been particularly harmful. However, Thrash and colleagues (2012) have recently highlighted that studies often showed *small* correlations rather than a lack of correlation altogether. Consequently, Thrash and colleagues (2012, p. 149) have argued convincingly that these correlations could be strengthened if content correspondence between implicit and explicit measures was improved and corrections were made for measurement error.

In meeting the recommendations of goal theorists that unconscious achievement goals be explored in how they interact with conscious achievement goals, the comparison of findings from unconscious and conscious methods is vital. Content correspondence represents a key concern in the development of an implicit method to begin exploring students' nonconscious achievement goals. While TAT-like materials might be adaptable to this endeavor, their conscious comparator is most likely to be an achievement goal questionnaire, to which other implicit methods might more closely correspond in content.

3.4.2 Implicit Relational Assessment Procedure

Among the more recent implicit tools that have emerged is the Implicit Relational Assessment Procedure (IRAP, Barnes-Holmes, Barnes-Holmes, Power, Hayden, Milne, & Stewart, 2006). This procedure has its origin in Relational Frame Theory (RFT, Hayes, Barnes-Holmes, & Roche, 2001), which posits, “the core units of human language and cognition are not associations per se, but derived stimulus relations” (Barnes-Holmes, Murtagh, Barnes-Holmes, & Stewart, 2010, p. 288). The associated methodology is the Relational Evaluation Procedure (REP), in which participants are presented with two stimulus items and asked to comment in their own time on the relation between them, for example by selecting the word *opposite* or *same* (e.g., one would select *same* if the two items were related). The IRAP draws on the content of the REP but also the reaction time and block structure of another implicit measure, the Implicit Association Test (to be discussed in Section 3.4.5, IAT, Greenwald, McGhee, & Schwartz, 1998).

Prior to starting an IRAP, participants are explicitly asked about their relations regarding the test subject. Then, during the IRAP, which is administered via a

computer programme, participants are presented with statements, words, or images and relations. Half of the blocks require the participant to respond in line with the relations they expressed prior to the test, and the other half require them to respond inconsistently with their pre-experimentally reported relations. Participants must respond as quickly as possible, and accurately. As such, if a participant responds that the relation between two concepts is *similar* when it is not, a cross will appear in the centre of the screen until the participant correctly categorizes the relation between the two concepts as *opposite*. The logic of the IRAP is that the selection of the relation descriptor will be quicker the more consistent the participant's relation between the target and attribute stimuli.

For example, in Barnes-Holmes and colleagues' (Barnes-Holmes, Hayden, Barnes-Holmes, & Stewart, 2008) study, participants were presented with a target stimulus word such as *love* or *murder* in the top centre of the screen and an attribute stimulus word such as *pleasant* or *unpleasant* directly below it. Participants were then asked to respond to the relation as being *similar* or *opposite*, which they could do by pressing the 'd' key for *similar* or the 'k' key for *opposite*. Presented with the target word *love* and the attribute word *pleasant*, a participant would most likely describe the relation as *similar*, so they would press the 'd' key and a reaction time would be captured. In this case, participants with strong relations between the two concepts should respond quicker that *love* and *pleasant* are *similar*. Likewise, participants will take longer to ascribe relations inconsistent with their implicit attitudes and beliefs, such as *love* and *pleasant* with *opposite*. The relative difference between the response times with which participants respond to consistent and inconsistent relations gives an indication of the strength of the relation, called the IRAP effect.

Two important features of the IRAP are that it does not depend on introspective access and that participants have to react as quickly as possible so that they do not have time to deliberate. Barnes-Holmes and colleagues argue that this results in the ability of the IRAP to capture "spontaneous and automatic evaluations, whereas explicit measures capture more carefully considered reactions" (Barnes-Holmes, Barnes-Holmes, Stewart, & Boles, 2010, p. 536). Both of these aspects suggest that an IRAP might represent a potential implicit

method for capturing achievement goals. A further argument for using the IRAP is that it improves on implicit methods that only take associations, rather than relations among concepts, into account. Barnes-Holmes and colleagues (Barnes-Holmes et al., 2010) have argued that this makes the IRAP more revealing. However, research on the IRAP is still in its early stages, with researchers still employing known-groups comparisons to determine the validity of the IRAP (Barnes-Holmes et al., 2010). More work will need to be done to ascertain how the IRAP could be adapted for accessing achievement goals, including decisions on the extent to which a relational rather than an associational approach is better suited to early explorations of the potential for nonconscious achievement goals.

3.4.3 Trace measures

Trace measures represent a very recent implicit method, designed by Winne and colleagues in response to questions over the assumption that individuals can validly comment on their goals (Winne & Perry, 2000; Winne, Jamieson-Noel, & Muis, 2002; Zhou & Winne, 2012). Traces can be understood as behavioral indicators of students' achievement goal orientations, and are collected by specially designed software while the student engages in learning using multimedia content. For example, in a recent study, Zhou and Winne (2012) used software called gStudy (Winne et al., 2006),²⁶ which provides students with cognitive tools that they can employ to navigate and enhance their study experience. These tools include “making notes, tagging selected content, clicking hyperlinks to expose new information, constructing new glossary entries, creating and manipulating concept maps to assemble information, chatting, searching for information and so forth” (Zhou & Winne, 2012, p. 414). Using this software, goal orientations were operationalized as tags and hyperlinks. For example, students could select content and tag it as “Important to know for the test” (Zhou & Winne, 2012, p. 414) or click the hyperlink “Find out more information about this” (*ibid.*). Each time a student used these tools, information on how the student was interacting with the tools

²⁶ Winne and colleagues are now using software called nStudy (Winne & Hadwin, 2013; Winne, Hadwin, & Beaudoin, 2010).

was generated. This *trace* information reflected the achievement goal that the student was endorsing according to the Elliot and McGregor (2001) 2 x 2 achievement goal model. As such, the aforementioned tag would reflect a performance approach goal, while the aforementioned hyperlink would represent a mastery approach goal. *Figure 6* below is a screenshot depicting how the learning activity is represented in the software, and the tools with which students might engage with the activity.

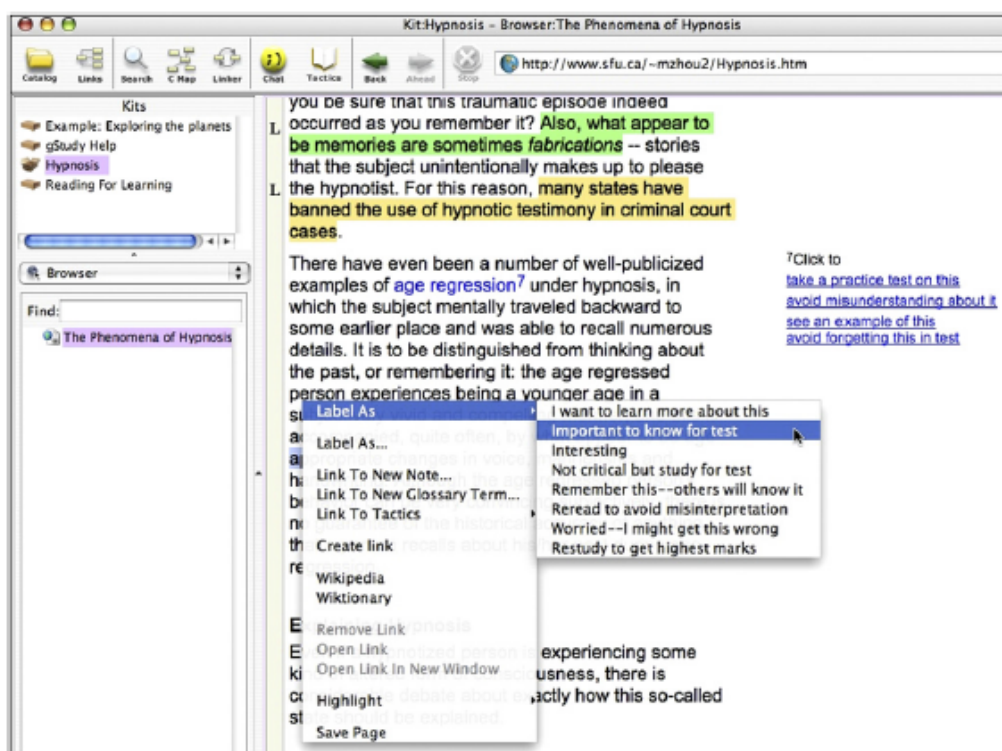


Figure 6. An example of what students see when they use gStudy Note. Adapted from Zhou and Winne (2012, p. 415).

Interestingly, when Zhou and Winne (2012) compared the goal traces with students' responses to a self-report goal questionnaire, the Achievement Goal Questionnaire (Elliot & McGregor, 2001), they failed to find a relationship between the two. However, when they compared both types of methods with students' performance, they found that goal traces correlated with performance, whereas self-reported goal orientations did not.

Studying goal traces represents an implicit method due to the unobtrusive means by which the traces are captured. Students are not asked outright about their goals, which might otherwise give rise to self-presentation strategies. Since asking students about their goals usually takes place either before or after

an achievement task, Zhou and Winne (2012, p. 417) also argue that assessing goal traces allows for a more in the moment, dynamic assessment that focuses not purely on intentions but on realized intentions. In other words, assessments of goal traces “can supplement static orientations that are operationally defined to be indifferent to the dynamics of learning activities” (Zhou & Winne, 2012, p. 413). Another strength of the approach, in terms of the discussion of the implicit and explicit in this thesis, is the promising potential for content correspondence across the goal traces and the self-report questionnaires: the content of the tag and hyperlink text was adapted from these very questionnaires, and thus should allow for better comparison across the implicit and explicit methods.

A potential weakness associated with the trace method is that students might act differently using the learning software than they would normally. Some may generally stop and think in a metacognitive way less than others, but the functionalities of the software might influence them to interact more with the information. Students may also differ in their interpretations of the tag and hyperlink text in the same way that individuals understand achievement goal questionnaire items differently from researchers. Indeed, “One learner’s interpretation of a tag titled as “Restudy to get the highest marks” may interpret “highest” in a normative sense while another interprets [it] in a mastery sense” (Zhou & Winne, 2012 p. 414). However, the primary weakness of using traces is that the method can only be employed using computer-based learning activities. Although it could be argued that much learning now does take place in these contexts, it is hard to see how researchers might explore goal traces using more typical learning tasks and in more typical learning contexts.

Given that Zhou and Winne (2012) have already experimented with using trace collection software for accessing achievement goals, a pertinent question at present is if their method would be appropriate for capturing nonconscious achievement goals as they have been conceptualized in this thesis. Zhou and Winne (2012) do not suggest that they are capturing the goal itself. Instead they are attempting to ascertain indicators of achievement goals: how the individual orients their behavior in pursuit of a particular goal. In line with the notion that the learning situation activates an achievement goal, which in turn is represented by part of a network of nodes with activation spreading to behavior

and strategies, the activated goal can set off behavior directed toward its fulfilment. Hence, while the goal itself remains implicit, the behavior, through its enactment, may become explicit to the individual. In the case of goal traces, the individual is not asked to account for their behavior, but only to behave and then tag and click hyperlinks in line with that behavior. This makes this method compliant with the current theorization of nonconscious achievement goals, and an exciting avenue for further exploration.

3.4.4 Priming

Another implicit method that may be useful in the exploration of nonconscious achievement goals is priming. Priming can be defined as the “temporary internal activation of response tendencies” (Bargh & Chartrand, 2000, p. 255). This can be done subliminally, so quickly that the participant is unaware of the prime, or supraliminally, where the prime is explicit but somewhat hidden in plain sight. Researchers often use the unrelated task paradigm when priming. As such, a participant is exposed either subliminally or supraliminally to the concept the researchers wish to prime on a first task, before their behavior is monitored on a second, seemingly unrelated task to determine if the primed concept has had an influence.

For example, Bargh and colleagues use the Scrambled Sentence Test, originally employed by Srull and Wyer (1979), as a supraliminal priming technique. This task is comprised of twenty-five sentences containing five words each, from which participants must construct a correct sentence using four words. Given the five words *tomatoes*, *ate*, *happy*, *the*, *she*, the participant could construct the four-word sentence “she ate the tomatoes,” leaving out the word *happy*. In an experiment, the experimental group receives the Scrambled Sentence Test task with synonyms of the construct to be primed appearing in fifteen of the sentences, while the other ten sentences are populated with neutral words. Those in the other experimental condition will receive the same task but with fifteen of the sentences containing words intended to prime a different construct. For example, in Bargh, Chen, and Burrows (1996), the first experimental condition was primed with synonyms of ‘politeness’, while the second experimental group was primed with words representing ‘rudeness’.

Finally, those in the control condition are presented with twenty-five entirely neutral sentences. Following this priming procedure, the participants are administered an apparently unrelated task, in which differences in behavior between the different conditions may play out. Bargh and Chartrand (2000) recommend the use of a funnelled debriefing task once the experiment has come to an end. Here, the researchers ask the participants a series of questions to assess whether the participants might have been aware of any patterns in the Scrambled Sentence Test, or of any influence the task may have had on their cognitions, behavior and affect on the later, ostensibly unrelated task. This works to rule out any explanations alternative to the prime in the participants' behavior on the second task.

In terms of representing a possible method for exploring nonconscious achievement goals, Bargh and Chartrand (2000, p. 254) observe, “priming and automaticity research techniques share a concern with the ways that internal mental states mediate, in a passive and hidden manner, the effects of the social environment on psychological processes and responses.” However, priming differs from the other implicit methods discussed till now in that it would not be used to *access* achievement goals, but to empirically discern whether the finding that more general behavioral and cognitive goals can be nonconsciously activated and pursued is also applicable to achievement goals. Furthermore, priming represents a potentially effective method for exploring the similarities and differences in the operation of conscious and nonconscious goals.

Arguably, much of the correlational evidence base concerning achievement goals and achievement-related cognitions and behaviors consists of findings about *conscious* achievement goals, given that conscious, self-report methods such as questionnaires have been used in their operationalization. Studies exploring nonconscious goals could use priming to attempt to temporarily activate these goals nonconsciously in order to assess whether they are correlated with the same cognitions, behaviors, and affect, albeit in the absence of awareness, control, effort, and an act of will.

Indeed, studies have come close to priming achievement goals. The study conducted by Bargh and colleagues (Bargh et al., 2001), mentioned in Section 3.2.4.1, involved the priming of the goal *to achieve*, using words such as

“succeed,” “strive,” and “attain,” and resulted in better performance, persistence in the face of obstacles, and resumption of interrupted goals for those who were primed versus those in a control group. Furthermore, Kawada, Oettingen, Gollwitzer, and Bargh (experiment 1, 2004) have attempted to prime performance and mastery goals in an exploration of implicit theories of intelligence (Dweck, 1999) and implicit projection effects. The researchers used an achievement scenario as a prime, and predicted that presenting preselected incremental theorists with an achievement scenario would activate a mastery goal and cause them to project this goal onto a fictitious character within the achievement scenario. In a second study, the researchers tried to clarify if an achievement goal had indeed been activated, and thus moved to a supraliminal priming procedure. However, here they primed the goal *to* compete, rather than achievement goals *per se*. In sum, studies have come close to priming achievement goals, and as such, priming presents a promising direction for exploring the nonconscious activation of achievement goals.

In using this priming technique to explore achievement goals, a first step might be in attempting to prime performance and mastery approach goals, with later studies incorporating the 2 x 2, or even the 3 x 2 model. Adapting the Scrambled Sentence Test would then involve selecting appropriate performance and mastery synonyms, selecting an achievement task, and then comparing the task behavior of participants in each of the two experimental conditions and a control group. This experimental design would allow for an assessment of whether and how achievement goals can be primed, and if so, the comparison of the extent to which they might influence on the participant’s behavior and appearance in the participant’s consciousness. If achievement goals can be successfully primed and result in responses that differentiate across the different theorized goal constructs, all the while without the individual’s ability to comment on their activation or pursuit, then there is some support for nonconscious goal operation and the limitations of currently predominant self-report methods.

3.4.5 The Implicit Association Test

One of the most widely employed implicit methods is the Implicit Association Test (IAT, Greenwald, McGhee, & Schwartz, 1998). IATs were developed in the early 1990's to meet the perceived need for indirect measures that could access those cognitions that self-report measures could not, either due to demand characteristics or lack of introspective access (Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellott, 2002, p. 4). Essentially, IATs are computer-categorization tasks that measure the strength of associations between target and attribute concepts by comparing reaction times. IATs are typically used to assess attitudes or evaluations such as biases towards (and against) racial groups (Greenwald, McGhee, & Schwartz, 1998), gender and mathematics (Cvencek, Meltzoff, & Greenwald, 2011), political party membership and voting practices (Hawkins & Nosek, 2012), and self-esteem (Greenwald & Farnham, 2000).

In a typical IAT, participants are required to categorize stimulus words according to two target groups and two attributes over a series of trial blocks. In the first block, participants might be presented with a computer screen containing the words “Good” and “Bad” at the top left and right of the screen, respectively. Stimulus words are presented in the middle of the screen and participants have to indicate whether the word is good or bad by pressing the “E” or “I” key on the keyboard, respectively. Typical words to be categorized include “joy”, “love”, “peace” and “wonderful” as good words, and “awful”, “agony”, “terrible”, and “evil” as bad words.

Once the participant has practiced this categorization, a second set of categories is presented, for example, with “African American” and “European American” at the top left and right of the screen, respectively. Images of the faces of members of these two groups appear in the centre of the screen, and participants must very quickly categorize faces as African American using the “E” key, or European American using the “I” key. After a similar number of practice trials, the third, critical block of the experiment begins. Participants allocate stimuli comprised of previously presented good and bad words and

faces to combined categories using the *same* key (i.e., “African American” and “Good” pressing the “E” key, “European American” and “Bad”, pressing “I”).

In the fourth (practice) and fifth (critical) blocks of the experiment, participants carry out the same categorization, but with the categories switched around (i.e., “African American” and “Bad”, “European American” and “Good”) in order to address ordering effects. The presentation of combined category blocks is also counterbalanced across participants, such that block three and five are switched for half the sample.²⁷ Once complete, the response times for blocks three and five are compared, and an IAT score of relative associative strength is calculated based on which pairing each participant was quicker at categorizing stimulus words to.

As with the more recently designed IRAP (discussed above, Section 3.4.2), the logic behind the IAT is that quicker reaction times imply the two concepts are automatically associated and congruent in the participants’ minds. Likewise, the longer the reaction time, the less automatic the association, and the greater the level of incongruence. So if participants are consistently quicker to categorize negative stimulus words to “Bad” when it is paired with “African American” than when it is paired with “European American”, the results would suggest a preference for European Americans.

Because the IAT requires very quick response latencies (between 300 – 10,000 ms), it avoids intervening thoughts and the time to come up with “self-presentation strategies” (Greenwald, McGhee, & Schwartz, 1998, p. 1465), which were earlier discussed as some of the problems with interviews, and affect, albeit to a lesser extent, anonymous questionnaires. Furthermore, the use of IATs has already allowed for the comparison of implicit and explicit constructs in a variety of fields. In some cases, IATs have been shown to predict spontaneous behavior, while explicit methods predict deliberate actions.²⁸ For

²⁷ In the original IAT (Greenwald, McGhee, & Schwartz, 1998), there were seven blocks, with blocks 3 and 5 described here split into two (i.e., block 3 = originally blocks 3 and 4, block 5 = originally blocks 6 and 7).

²⁸ This has sparked investigations of a ‘dual process’ model, and various patterns in which this may occur (Perugini, 2005).

example, in Brunstein and Schmitt's (2004) study of adapting the IAT to access implicit achievement motives, they found that the IAT and explicit self-ratings were uncorrelated, and that the explicit self-ratings predicted self-reported task enjoyment, while the IAT scores successfully predicted participants' test performance. Asendorpf, Banse and Mücke (2002) obtained similar results for their shyness IAT, which predicted spontaneous shy behavior such as facial and body movements, whereas participants' explicit self-reports about their shyness predicted controlled behaviors such as their "speech and movements illustrating speech" (p. 383).

Given that researchers are necessarily interested in students' spontaneous achievement goals, the adaptation of an achievement goal IAT could help determine if implicit and explicit measures of achievement goals predict different aspects of achievement. Other researchers have found that implicit (IAT) and explicit (self-report) measures sometimes do relate. Indeed, in a study on gender identity and attitudes to mathematics, Nosek, Banaji, and Greenwald (2002) were interested in exploring whether explicit attitudes, implicit attitudes, or both were related to performance in math. Nosek and colleagues found that *both* explicit and implicit attitudes to math were significant predictors of math SAT performance. In each of these cases (dissociation or related), adapting an IAT for nonconscious achievement goals would allow for such a comparison to be made, thereby assisting in the exploration of the interplay between explicit and implicit goals.

Of course, there would be some limitations with using an IAT for accessing achievement goals. As with the goal traces measure, an IAT has the limitation of being a computer-based task, with its limited ecological validity. Here, as in Brunstein and Schmitt's (2004) adaptation of an IAT for implicit achievement motives, calculations of this method's predictive power in terms of achievement behavior may justify its usage. However unlike the goal traces measure, an IAT could not represent a dynamic, in the moment exploration of achievement behavior. Instead, an achievement goal IAT would be more like an achievement goal questionnaire in that it is a one-time measure, and thereby would provide a more trait-like picture of the student's achievement goals. However, as with achievement goal questionnaires, IATs could be run in

different achievement situations and repeatedly over a period of time to provide an idea of the stability or malleability of nonconscious achievement goals.

Another possible limitation with using the IAT to access potentially nonconscious achievement goals is that IATs were originally designed to portray the strength of relative associations, from which researchers could extrapolate bias or preference.²⁹ Achievement goals are not normally conceived of as biases or preferences. However, in the same way that goal traces are *indicators* of achievement goals rather than affording access to the achievement goals directly, the congruence between competence-related concepts and an attribute concept on an IAT for achievement goals could provide an indication of the individual's achievement goal. As such, IATs might be one answer for researchers interested in assessing nonconscious achievement goals.

Indeed, two groups of researchers have more recently begun to draw from IATs to design their own implicit methods for accessing achievement goals. Urdan and Cafasso (2011) designed a Like Me/Not Like Me measure, with the categories *Like Me* and *Not Like Me* at the top left and right of the screen, and participants had to press a key corresponding to left or right to judge whether stimulus words were like them or not. The researchers used eight stimulus words each for performance approach (e.g., “Best”, “Surpassing”) and avoidance (e.g., “Worse”, “Inferior”) and mastery approach (e.g., “Improvement”, “Comprehending”) goals. Two measures emerged: one captured whether participants indicated a word was indeed “Like Me” or “Not Like Me”, while the other captured the response time for these categorizations. However, an IAT works by assessing how closely two constructs are associated for an individual by the reaction time, rather than by asking the participant how like them a stimulus word is. For this reason, there is a danger that both the allocation of the stimulus word and the reaction time within the Urdan and Cafasso (2011) Like Me/Not Like Me method represent another version of self-

²⁹ In their adaptation of an Implicit Association Test for implicit motives, Brunstein and Schmitt (2004) tackled this issue by suggesting that the IAT would tap “motivational preferences that exist outside of a person's awareness but are expressed in her or his behavior in the presence of appropriate incentives” (p. 538).

report method. This potentially explains why a relationship was observed between the reaction times and the performance approach and avoidance subscales of the trichotomous PALS questionnaire (both $r = -.16$, $p < .05$) when Urdan and Cafasso administered the Like Me/Not Like Me method to a sample of 162 undergraduates.

Marzouq, Slade and Carr (2012) have also adapted an IAT-based achievement goal measure called the IAT-Type Measure (IAT-T). The IAT-T explores the 2 x 2 achievement goal model, and employs the combined category method of the original IAT. As such, the category labels at the top of the screen are *Self* and *Other*, and *Approach Success* and *Avoid Failure*. The goal-relevant stimuli are phrases instead of individual words, and include “succeeding to do” (mastery approach) and “doing even better” (performance approach) as *Approach Success* phrases, and “avoid doing less well” (performance avoidance) and “avoid not completing” (mastery avoidance) as *Avoid Failure* phrases.

In a study with 99 undergraduates who were also administered explicit self-report questionnaires, Marzouq and colleagues (2012) found the IAT-T to be reliable, but did not find a relationship between the IAT-T and self-reports. Although this method is more in line with the process of an IAT than Urdan and Cafasso (2011), and more in line with the findings of no relationship between implicit and explicit methods such as in Brunstein and Schmitt (2004), a potential issue with the IAT-T is the departure from having just one word appearing in the centre of the screen. Replacing this one word with a phrase may result in different lengths of processing time, especially given that these phrases include double negatives and different numbers of words, which may represent the reason for the difference in reaction time, rather than the incongruence or lack of automaticity of the association.

Given the aforementioned strengths of the IAT in exploring implicit phenomena and its amenability to adaptation for achievement goals, Chapter 4 explores the design of original IAT methods for achievement goals that address the weaknesses of the aforementioned attempts.

Summary

An exploration of nonconscious achievement goals in relation to conscious achievement goals will inevitably require a mix of implicit and explicit methods. Chapter 2 explored current explicit methods while this section has focused on a range of possible implicit methods. Each of these methods has been assessed for its strengths and weaknesses, as well as for its appropriateness in exploring the interplay between conscious and nonconscious achievement goals. Given the successful adaptation of an IAT for implicit achievement motives (Brunstein & Schmitt, 2004) and attempts to adapt the IAT for achievement goals (Marzouq, Slade, & Carr, 2012; Urdan & Cafasso, 2011), in addition to the use of priming in the activation of cognitive goals including the goal to achieve (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001) and the projection of learning and performance goals (Kawada, Oettingen, Gollwitzer, & Bargh, 2004), these two methods represent appropriate candidates for the preliminary empirical exploration of nonconscious goals in this thesis, as carried out in the following chapters.

4 Study 1 Exploration of a possible method for capturing nonconscious achievement goals: Development, design and administration of 2 achievement goal IATs

Introduction

The previous chapters have addressed research aims 1, 2, and 3a. They have explored definitional issues with achievement goals, how they are currently operationalized, and the assumptions underlying them. They have examined the findings of literature on implicit cognition and nonconscious goal pursuit and the implications of these literatures for how achievement goals might be theorized and captured. This chapter addresses aim 3b, which is to *assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through designing and running a series of studies to empirically test if achievement goals can operate and be captured without conscious awareness*. More specifically, this chapter focuses on aim 3b(i): *developing an implicit method to access achievement goals and comparing it with an explicit achievement goal method*. In other words, can an implicit method for accessing achievement goals be designed? Are there differences between what an implicit versus an explicit method can tell us about a student's goals, and if so, what are they?

This chapter reports on the development of two achievement goal implicit association tests, and Study 1 in which these were administered, wherein the resulting IAT scores were compared with responses on the explicit, self-report Achievement Goal Questionnaire-Revised (AGQ-R, Elliot & Murayama, 2008). The chapter begins by documenting the design and administration considerations for the two original achievement goal implicit association tests, the Self/Other Referent IAT and the Valence IAT. The chapter then moves on to the comparative study, in which 40 university students completed the self-report AGQ-R and, after an interval of at least a week, also completed either the Self/Other Referent IAT or the Valence IAT. The main findings were that both adapted achievement goal IATs were internally consistent measures, and that students' goal preferences according to the IATs did not correlate significantly

with their AGQ-R responses. These findings are then discussed, in particular the lack of correlation and its fit with the theorized and empirically supported disjunction between explicit self-reports about students' achievement goals and goals that may be operating implicitly. Finally, the scene is set for the next study, which goes on to compare these implicit and explicit methods with participants' behavior in an achievement situation.

4.1 Design of the Achievement Goal IATs

Chapter 3 drew on the work of Bargh (1990; Bargh & Chartrand, 1999) to argue that if achievement goals are theorized as mentally represented, hypothetically, they can be activated and operate without conscious awareness in certain conditions. Empirical work exploring the potential for nonconscious achievement goals must equally be able to show nonconscious goals in operation and capture them. Capturing nonconscious achievement goals requires a devoted method; Chapter 3 suggested how one such method, the Implicit Association Test (IAT, Greenwald, McGhee, & Schwartz, 1998), represents an appropriate candidate.

An introduction to the IAT and the potential to use it to access achievement goals was provided in Chapter 3, but given the current task of designing an achievement goal IAT, the following section provides greater detail. As previously mentioned, the IAT was developed in the 1990's in line with the belief "that [indirect measures] provided access to a cognitive domain that was not reached by self-report measures" (Greenwald et al., 2002, p. 4). An IAT is essentially a computerized categorization task that relies on response latencies and works on the logic that allocating test stimuli, whether words or images, to combined categories (i.e., African American and 'Good', European American and 'Bad') using the same response key is quicker when the categories are more closely associated in the participant's mind.

Although there are other formats for IATs, such as the Go/No Go test (Nosek & Banaji, 2001), the typical IAT structure consists of seven blocks. Taking as an example Cvencek, Meltzoff, and Greenwald's (2011) IAT exploring elementary school children's math-gender stereotypes, in the first block, just the bipolar target concept is presented at the top left (e.g., Boy) and right (e.g., Girl) of the

screen. Stimulus words comprised of *boy* and *girl* names will appear one at a time in the centre of the screen. The child will need to categorize each name to either Boy or Girl, using keys on the left or right of the keyboard (e.g., ‘E’ for left, Boy, ‘I’ for right, Girl). This needs to be done as quickly as possible, and reaction times (in milliseconds) are recorded by the chosen IAT software. If the child allocates the name to the wrong category, a cross will appear in the centre of the screen until the child categorizes it correctly, for example, ‘David’ into the ‘Boy’ category. In the second block, just the bipolar evaluative attributes are presented at the top left (e.g., math) and right (e.g., reading) of the screen, and stimulus words are again presented in the centre of the screen, in this case words associated with the subjects, such as ‘numbers’, ‘graph’, or ‘books’.

In the third (practice) and fourth (test) blocks, the formats of the previous blocks are combined. ‘Boy’ would appear just above ‘math’ at the top left of the screen, and ‘Girl’ would appear just above ‘reading’ at the top right of the screen. As before, a stimulus word such as ‘graph’ would then appear in the centre of the screen and the child would need to allocate this word to either of the two sides of the screen using the keyboard. In the fifth block, just the evaluative attributes appear, and this time they have been switched around. The child then again categorizes stimulus words. If ‘math’ originally appeared on the top left of the screen, it now appears at the top right, and vice versa with ‘reading’. In the sixth (practice) and seventh (test) blocks, the switched evaluative attributes appear just below the target concepts again, and the child must allocate stimulus words to the paired categories. The presentation order of blocks 3 and 4, and 6 and 7 are counterbalanced across participants.

The *IAT effect* is then computed based on the latencies in combined category blocks 3, 4, 6, and 7. If the child is quicker (has faster reaction times) at allocating math-related words to the combined category of ‘Boy’ and ‘math’ (blocks 3 and 4) than to a combined category of ‘Girl’ and ‘math’ (blocks 6 and 7), then the child is said to have an implicit or automatic Math-Boy preference. The actual IAT score is represented as *D*, a relative index of the strength of the association. This is calculated using an improved scoring algorithm tested by Greenwald, Nosek, and Banaji (2003) to take into account problems associated with latency measures, such as “speed-accuracy tradeoffs (e.g., Wickelgren,

1977; Yellot, 1971), age-related slowing (e.g., Faust, Balota, Spieler, & Ferraro, 1999; Ratcliff, Spieler, & McKoon, 2000), and spurious responses that appear as extreme values (or *outliers*; [Ulrich &] Miller, 1994; Ratcliff, 1993)” (Greenwald et al., 2003, p. 198).³⁰ To arrive at the IAT score D , the below equation is used (see Equation 1). All sample means (\bar{X}) are corrected reaction times in milliseconds, *crit1* stands for blocks 6 and 7, *crit2* stands for blocks 3 and 4, and standard deviation (S) is pooled across critical practice and test blocks (3, 4, 6, 7).

Equation 1. Calculation of relative index of strength of the association (in line with Greenwald, Nosek & Banaji, 2003)

$$D = \frac{\bar{X}_{crit1} - \bar{X}_{crit2}}{S_{crit1 + crit2}}$$

If the mean corrected response time in blocks 6 and 7 is less than blocks 3 and 4, the overall score will be negative, indicating the participant’s implicit preference for the combined category configuration in blocks 6 and 7. The further the IAT score is from 0, either positively or negatively, the stronger the preference. In other words, IAT scores closer to 0 indicate “implicit indifference – no difference in the association strengths between response blocks” (Nosek, 2005, p. 570).

This introduction elucidates several areas where decisions had to be made in order to adapt the IAT for capturing achievement goals: which software to use, what the target and attribute categories might be, what words could be used as the test stimuli, and the number of trials per block. These design decisions and their implications for what the resulting IAT scores might mean are discussed below.

³⁰ Their improved algorithm completes the following steps in order: uses data from all the combination blocks (trial blocks 3 and 6, and test blocks 4 and 7), eliminates trials with latencies greater than 10,000ms, eliminates subjects for whom more than 10% of trials have a latency of less than 300ms, takes into account the mean correct latencies for each block, computes a pooled standard deviation for all practice trials (3 and 6) and test trials (4 and 7), replaces error latencies with the block mean + 600ms, averages the resulting values for each of the four blocks, computes two differences ($B6 - B3$, $B7 - B4$), divides each difference by its associated pooled-trials SD , and averages the two resulting quotients (Greenwald et al., 2003, p. 214).

4.1.1 Software

The generic IAT can be configured using software made commercially available by Inquisit, while analysis is usually conducted on SPSS. However, Meade (2009) has designed a free, open-source version of the IAT called *FreeIAT*, compatible with the Microsoft Windows operating system. This includes a set up programme, with which researchers can customize their own IATs using text or images, as well as the actual IAT administration programme. Furthermore, the *FreeIAT* reports output to two text files, one of which contains all the raw data from IAT trials, and the second which contains data such as each participant's average raw and corrected response times, pooled standard deviations, and the overall IAT score using Greenwald, Nosek, and Banaji's (2003) improved algorithm. Given that the *FreeIAT* was indeed free and allowed for IAT configuration, administration, and even score calculation, it was chosen as the software for adapting the achievement goal IATs.

The main difference between the procedure of the generic IAT and the *FreeIAT* programme was regarding the combined category blocks. On the generic IAT, blocks 3 and 6 are practice trials for critical blocks 4 and 7. On the *FreeIAT*, there are only five blocks, signifying that blocks 3 and 4 have been collapsed into a single block. Hence, in the *FreeIAT*, block 1 introduces the participant to the target category, block 2 introduces the participant to the attribute category, block 3 comprises the combined categories stage, block 4 switches the sides of the attribute categories, and block 5 comprises the switched combined categories stage. This difference was not considered problematic in terms of its potential impact on the eventual IAT score given that Greenwald and colleagues' (2003) improved scoring algorithm for *D* takes blocks 3, 4, 6, and 7 into account. Furthermore, the amount of trials in blocks 3 and 5 can be configured as needed. Also, pertinent to computing the IAT score, the pooled standard deviation of blocks 3 and 4, and 6 and 7 is retained in the *FreeIAT* by pooling standard deviations from blocks 3 and 5.

4.1.2 Target, Attribute and Stimuli

FreeIAT software allows researchers to configure categories as they require. Typical IATs have at their core a bipolar target concept forming one category,

and a bipolar evaluative attribute concept forming another category, with stimuli that fit into each of these categories. As in the example above, of Cvencek, Meltzoff, and Greenwald's (2011) math-gender stereotype study of elementary school students, 'Boy' and 'Girl' represented the target concept of gender and 'math' and 'reading' represented the evaluative attribute of subject type. The stimuli words for the gender categories were boy and girl names, whereas the stimuli words for the subject categories were topics (e.g., addition) or aspects (e.g., books) belonging to that subject. Choosing target and attribute categories for the achievement goal IAT involved an attempt to balance the contents of explicit achievement goal methods, reflecting the current theory and operationalization of achievement goal constructs, with the IAT procedure. The target category would of course involve some manifestation of the goal construct, while the attribute category was less definite.

Given the bipolar nature of the target category, and that achievement goal frameworks have been dichotomous, trichotomous, 2 x 2, and even 3 x 2, the approach selected was to begin with a dichotomous performance and mastery goal model, rather than the 2 x 2 model selected by Marzouq, Slade and Carr (2012) on their IAT-T. By incorporating the approach and avoidance distinction into their IAT-T, Marzouq and colleagues introduced phrases of varying numbers of words (e.g., "Accomplishing much," "Avoid not completing," "Avoid doing less well") instead of one-word goal stimulus words, thereby departing from the procedure of a typical IAT and possibly providing an alternative explanation for different reaction times. Hence, it was decided that once some initial research had been conducted with dichotomous categories, a further study could run multiple IATs with each individual, as in the study by Cvencek and colleagues (2011), where one IAT measured gender identity (i.e., *me* with *male*), one IAT measured the math-gender stereotype (i.e., *male* with *math*), and one IAT measured math self-concept (i.e., *me* with *math*) to give an overall picture of math-gender stereotypes. This could be translated for achievement goals so that it could take into account the complexity and further dimensions of the later achievement goal frameworks.

In terms of the category labels, one idea was to use the definitions of performance and mastery goals, such that performance would be represented

by ‘demonstrate competence’ and mastery would be represented by ‘develop competence’. Using two-word category titles was not considered problematic given the usage of the *not me* category in IATs assessing self in relation to another concept (e.g., Cvencek et al., 2011; Greenwald & Farnham, 2000). However it was decided that these two categories might not be visually disparate enough, especially given the fast responses required of participants. Another idea was to use the different goals types, ‘Performance Goals’ and ‘Mastery Goals’, as category labels. The main focus of the words on performance and mastery was considered distinctive enough visually and conceptually, in addition to representing two different goal approaches to a task.

In terms of participants’ familiarity with these two category titles, a specific feature of the *FreeIAT* was taken into account. The IAT administration programme of the *FreeIAT* begins with an instruction page that presents all the words that will appear during the blocks: four categories and all the stimuli words that might be assigned to each. As such, participants would be provided with a chance to view and comprehend the distinction between the two concepts prior to beginning the IAT. Three other factors were taken into account. Firstly, given the structure of the IAT blocks, participants would be engaging in a full practice block of allocating stimulus words into either category, which would elucidate the distinction. Secondly, the researcher was in control of the amount of trials for this block, and could ensure that there were more trials to ensure the participants’ correct categorization. And thirdly, research has shown that “category labels are clearly of great importance for the IAT, but the stimulus exemplars can nevertheless influence the construal of those categories. Stimulus exemplars can aid in the definition of the superordinate category” (Nosek, Greenwald, & Banaji, 2007, p. 282). Hence, participants would be exposed to the category labels as part of the overall IAT, rather than just as standalone labels.

Given the exploratory nature of designing an IAT to capture achievement goals, two different approaches were tested out in terms of the evaluative attribute category. This resulted in two different IATs but an underlying agreement in their aims. The first approach was to use the format of self-esteem IATs, such

that participants would categorize stimulus words to a combined category of ‘Performance Goals’ or ‘Mastery Goals’ with ‘Self’ or ‘Other’, resulting in a *Self/Other Referent IAT*. This would be more in line with the IAT-T designed by Marzouq and colleagues (2012), and even the self-comparison of the Like Me method designed by Urdan and Cafasso (2011). The logic behind this attribute category was that participants with performance goals would be quicker to allocate *performance* and *self* stimulus words to ‘Performance Goals’ when it was paired with ‘Self’ than when it was paired with ‘Other’. Those with mastery goals would be quicker at allocating *mastery* and *self* stimulus words to ‘Mastery Goals’ when paired with ‘Self’ than ‘Other’. The shorter reaction times would indicate an implicit, automatic association between their concept of self and the goal-related concepts represented by the stimulus words, with the extrapolation that those goal-related concepts most closely associated with the concept of self would be those implicitly preferred by that individual.

The second approach was to use ‘Good’ and ‘Bad’ as the attribute labels, constructing a positive-negative or valence-based IAT, the *Valence IAT*. The logic here was that participants with performance goals would be quicker to allocate *performance* and *good* stimulus words to ‘Performance Goals’ when this category was paired with ‘Good’ than ‘Bad’, and mastery goal participants would be quicker to allocate *mastery* and *good* stimulus words to ‘Mastery Goals’ when this category was paired with ‘Good’ than ‘Bad’. Here, the shorter reaction times would indicate an implicit, automatic association between the presented goal-related stimuli and their positive or negative valence, with the implication that the goal more closely associated with a positive valence would be implicitly preferred by that individual.

Stimulus words were then required to fit into each of the six categories: Performance Goals, Mastery Goals, Self, Other, Good, and Bad. Given the potential problems inherent in using phrases rather than words (Marzouq et al., 2012), it was decided that the IATs would have single word stimuli. Previous IATs provided examples of these single words for the latter four categories, so the exemplars were largely extracted from these. For example, Greenwald and Farnham’s (2000) self-esteem IAT provided stimulus words, all in the form of pronouns, for *self* (I, me, my, mine) and *other* (they, them, their, it). Greenwald,

McGhee, and Schwartz's (1998) original IATs provided some stimulus words for *good* (love, pleasure, peace, happy) and *bad* (agony, hatred, awful, evil, grief), selected from norms reported by Bellezza, Greenwald, and Banaji (1986). Selection of the *Performance Goals* stimulus words was based in part on words used in the Scrambled Sentence Test used in the Kawada, Oettingen, Gollwitzer, & Bargh (2004, experiment 2) priming study to activate the competition goal construct. These were verbs including better, compete, and overtake, all representing the normative evaluative referent standard for performance goals. Similar *Mastery Goals* stimulus words were then chosen that focused on the self- and task-based development of competence, such as understand, persist and learn.

Across the categories, there were thus four words each for the Self and Other categories, six words each for the Good and Bad categories, and six words each for the Performance Goals and Mastery Goals categories. The difference in number of stimulus words by IAT-type (four words for self/other, six words for valence) was not considered problematic given the guidance of Nosek, Greenwald and Banaji (2007) that "the magnitude and reliability of IAT effects [are] relatively unaffected by the number of stimulus items per category" (p. 270). Table 3 and Table 4 below illustrate the categories and stimuli words for both types of IAT.

Table 3. Category labels and stimuli for the Self/Other Referent IAT

Self	Other	Performance Goals	Mastery Goals
I	They	Win	Learn
Me	Them	Better	Understand
My	Their	Best	Comprehend
Mine	Theirs	Compete	Improve
		Outperform	Progress
		Overtake	Persist

Table 4. Category labels and stimuli for the Valence IAT

Good	Bad	Performance Goals	Mastery Goals
Joy	Agony	Win	Learn
Love	Hatred	Better	Understand
Pleasure	Pain	Best	Comprehend
Wonderful	Awful	Compete	Improve
Peace	Evil	Outperform	Progress
Happy	Grief	Overtake	Persist

Each of these words was then typed into the configuration programme, so that the IAT administration programme could be run. The *FreeIAT* programme determined the frequency with which each stimulus word would appear randomly such that no single stimulus would be repeated consecutively. In the actual IAT programme, all categories and stimulus words began with a capital letter. Furthermore, attribute categories and their stimulus words appeared in white, while target categories and stimulus words appeared in green. The configuration programme did not provide an option to change the color of the screen (black) or the words (white/green), but these were not considered problematic. However, the size of the categories and stimulus words was small, so Microsoft Visual Basics (2013) software was used in editing the source code to increase it. An example image of the achievement goal Valence IAT screen during the combined category block is shown in *Figure 7*.

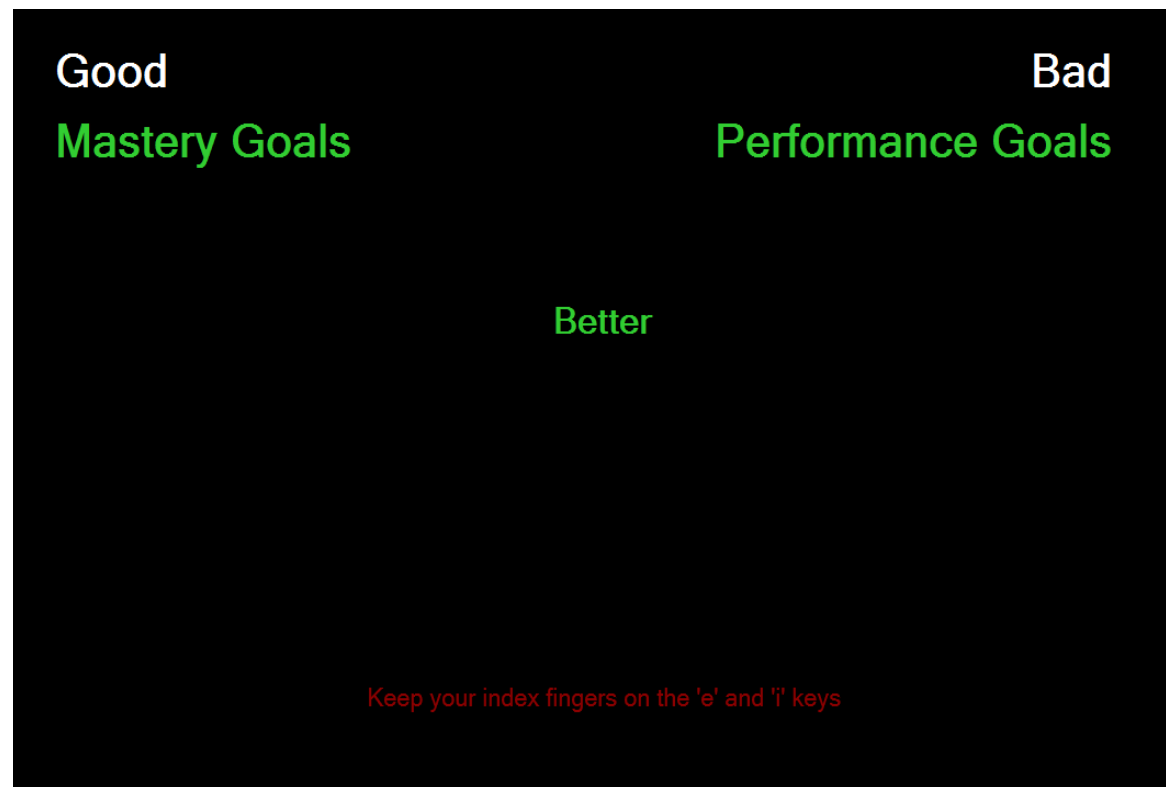


Figure 7. Categories and stimulus words in green and white against the black background

4.1.3 Number of trials and block order

In deciding on the number of trials per block, the suggestions of the original IAT developers were consulted. Greenwald, Nosek, and Banaji's (2003) summary of a typical IAT procedure involves 20 trials each in blocks 1, 2, 3, 5, and 6, and 40 trials each in Blocks 4 and 7. As already mentioned, the *FreeIAT* collapses blocks 3 (practice) and 4 (test), and 6 (practice) and 7 (test) of the generic IAT into blocks 3 and 5. Taking this into account, the recommendation would thus be 20 trials in block 1, 20 trials in block 2, 60 trials in combined categories block 3, 20 trials in block 4, and 60 trials in combined categories block 5.

The Self and Other and Good and Bad word stimulus learning trials (block 1) were deemed simple enough for the participants to categorize, and were assigned 36 trials in each IAT. As the *FreeIAT* software ensured that no stimulus word would appear twice consecutively, 36 trials allowed for the possibility that each of the six Good and six Bad words could appear three times, and the decision was made to use the same amount of trials for the Self/Other Referent IAT so that the IATs would be equal in duration. Acknowledging the argument that participants might be less familiar with the distinction between the

Performance Goals and the Mastery Goals, 48 trials were presented in block 2 for each type of IAT to allow participants more practice. Given the combination of the practice and test blocks in the *FreeIAT*, the combined categories blocks 3 and 5 were given a larger amount of trials, at 108. The reverse word learning block 4 was allocated 36 trials to mirror block 1. Nosek, Greenwald and Banaji (2007) have more recently recommended (in terms of the generic IAT) “changing B5 to 40 response trials as a standard corrective for a persistent extraneous influence of task order” (p. 271), in line with the finding of Nosek and colleagues (Nosek et al., 2005) that “using 40 response trials in B5 instead of 20 significantly reduced the influence” (Nosek et al., 2007, p. 272). Having 36 trials in block 4 is thus better than 20, and closer to the recommended 40. Table 5, Table 6, Table 7, and Table 8 below provide a summary of the amount of trials per block, for both types of achievement goal IAT. Also, it is to be noted that the presentation of blocks 3 and 5 would be counterbalanced across participants; hence the terms Condition A and Condition B are assigned.

Table 5. Schematic overview: Self/Other Referent IAT Condition A
(Performance Goals paired with Self first)

Block	Left key assignment (E)	Right key assignment (I)	No. of Trials
1	Self	Other	36
2	Performance Goals	Mastery Goals	48
3	Self	Other	108
	Performance Goals	Mastery Goals	
4	Other	Self	36
5	Other	Self	108
	Performance Goals	Mastery Goals	

Table 6. Schematic overview: Self/Other Referent IAT Condition B
(Mastery Goals paired with Self first)

Block	Left key assignment (E)	Right key assignment (I)	No. of Trials
1	Self	Other	36
2	Mastery Goals	Performance Goals	48
3	Self	Other	108
	Mastery Goals	Performance Goals	
4	Other	Self	36
5	Other	Self	108
	Mastery Goals	Performance Goals	

Table 7. Schematic overview: Valence IAT Condition A**(Performance Goals paired with Good first)**

Block	Left key assignment (E)	Right key assignment (I)	No. of Trials
1	Good	Bad	36
2	Performance Goals	Mastery Goals	48
3	Good	Bad	108
	Performance Goals	Mastery Goals	
4	Bad	Good	36
5	Bad	Good	108
	Performance Goals	Mastery Goals	

Table 8. Schematic overview: Valence IAT Condition B**(Mastery Goals paired with Good first)**

Block	Left key assignment (E)	Right key assignment (I)	No. of Trials
1	Good	Bad	36
2	Mastery Goals	Performance Goals	48
3	Good	Bad	108
	Mastery Goals	Performance Goals	
4	Bad	Good	36
5	Bad	Good	108
	Mastery Goals	Performance Goals	

Once both IATs had been configured, a study was designed to test them out. A description of Study 1 and its findings follows.

4.2 Administration of Achievement Goal IATs and AGQ-R

4.2.1 Background

The previous chapters have outlined both the assumptions underlying current achievement goal theorization and operationalization and the challenges to these assumptions represented by findings on implicit cognition. One of the ways in which the exploration of nonconscious achievement goals might begin is by examining any differences between implicit and explicit methods.

Chapters 2 and 3 have overviewed the methods with which conscious achievement goals are operationalized and the implicit methods that may be helpful for exploring nonconscious achievement goals. In line with the first part of aim 3b(i), *developing an implicit method to access achievement goals*, the previous section of this chapter has illustrated the design of two achievement goal IATs, the Self/Other Referent IAT and the Valence IAT. This section

addresses the second part of aim 3b(i), *comparing* [the implicit methods] *with an explicit achievement goal method*. As such, this section provides a test of the implicit methods in addition to a comparison of their outcomes with those of the more commonly used explicit self-report method, the Achievement Goal Questionnaire-Revised (AGQ-R, Elliot & Murayama, 2008).

The aims of the study are thus to explore the reliability of the IATs and to compare the IAT scores with the AGQ-R responses. As mentioned in the introduction, the overarching question guiding this research is: *Are the implications of research on implicit cognition applicable to achievement goal theory?* (Research Question 3) More specifically, the research question for this study was: *are there any differences between what implicit and explicit achievement goal methods tell us, and if so, what are they?*

4.2.2 Hypotheses

There were no specific predictions for internal consistency of the newly adapted IATs. However, IATs usually display greater reliability values than other implicit measures (Teige, Schnabel, Banse, & Asendorpf, 2004; Bosson, Swann, & Pennebaker, 2000), with split-half correlations or alphas between .7 and .9 (Nosek et al., 2007, p. 273), so it was predicted the values would be similar for the Self/Other Referent and Valence IATs.

It was predicted that there might be some dissociation and thus a lack of correlation between the implicit and explicit achievement goal methods. This prediction was based on the arguments posed in the previous chapters: firstly that respondents may use self-presentational strategies in responding to explicit methods, and secondly, that goals may operate outside of conscious awareness, and may therefore be inaccessible in terms of self-report. Generally, research on the nature of the correlation between IATs and self-report methods has revealed differing findings over the years, with older studies finding “weak to absent” (Nosek et al., 2007, p. 278) relations while later studies have shown stronger relations (e.g., Greenwald et al., 2003; Hofmann, Gawronski, Gschwender, Le, & Schmidt, 2005; Nosek, 2005).

In summary, the predictions for Study 1 were that:

1. *The Self/Other Referent IAT and the Valence IAT will demonstrate appropriate reliability.*
2. *The IATs will not correlate with the AGQ-R.*

4.2.3 Method

4.2.3.1 Ethical Approval

Ethical approval for this study (and all following studies in this thesis) was sought and granted by the School of Education Ethics Committee (for an example, see Appendix 10.1.1). This was especially necessary given the researcher's interest in exploring nonconscious processes and motivation, and resulted in such practices as providing limited information during recruitment and the covert measurement of behavior (i.e., response times on the IAT) in order to avoid influencing participants' responses to the achievement goal methods (and in later studies, participants' awareness of achievement goal primes or behavior on achievement tasks).

4.2.3.2 Participants

Participants were 40 students enrolled in different faculties at a university in the northeast of England. There were 20 female and 20 male students in the sample. 19 participants were undergraduates (years 1-4), and the remaining 21 were postgraduates (Masters and PhD students). All participants were contacted personally by the researcher and asked if they would like to volunteer their participation.

4.2.3.3 Materials

4.2.3.3.1 Explicit Method

The explicit achievement goal method in this study was the Achievement Goal Questionnaire-*Revised* (AGQ-R, Elliot & Murayama, 2008, see Appendix 10.1.2). This is comprised of 12 items for four different subscales that match the 2 x 2 achievement goal model: Performance Approach ("My aim is to perform well relative to other students", 3 items, $\alpha = .84$), Performance Avoidance ("I am striving to avoid performing worse than others", 3 items, $\alpha = .90$), Mastery

Approach (“My aim is to completely master the material presented in my classes”, 3 items, $\alpha = .62$), and Mastery Avoidance (“I am striving to avoid an incomplete understanding of the course material”, 3 items, $\alpha = .76$).

Participants were asked to respond to such statements using a 5-point Likert scale that ranged from 1 “strongly disagree” to 5 “strongly agree”. Goal statements were shuffled so no two items pertaining to the same underlying goal construct appeared consecutively. Given that the participants came from a variety of disciplines, an instruction at the top of the questionnaire sheet asked that when answering the questionnaire they should think about their goals for their classes at university in general, rather than for a specific class. This required replacing the phrases “this class” or “this course” which appear on the original AGQ-R in items 1 and 7, respectively, with “my classes”.

4.2.3.3.2 Implicit Method

For the implicit method, participants completed either the Self/Other Referent IAT or the Valence IAT, both described above. Allocation of IAT type and condition (A or B) alternated based on the date participants completed and returned questionnaires. IATs were presented to participants on a laptop PC with a 13.3” (33.8cm) screen in a testing room free from visual or auditory disruption.

4.2.3.4 Procedure

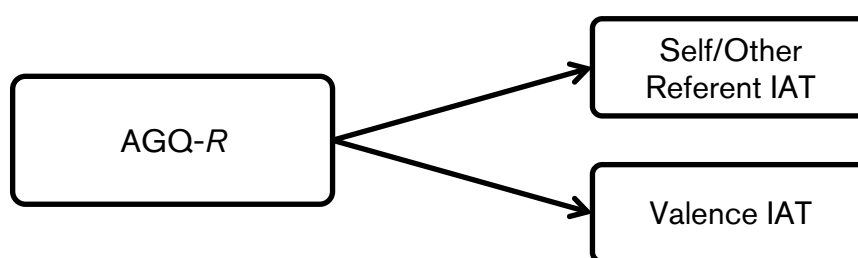


Figure 8. Study 1 methods

An overview of the procedure is illustrated in *Figure 8* above. Each individual received a preliminary consent form (see Appendix 10.1.3) and the Achievement Goal Questionnaire-Revised (AGQ-R, Elliot & Murayama, 2008), which they took away to complete and return. Out of a total of forty-three questionnaires,

forty were returned (93% response rate). A date and time 1-4 weeks following the return of questionnaires was then agreed for the Implicit Association Test, so as to eradicate potential priming effects of taking the IAT just after the questionnaire. Indeed, Nosek, Greenwald and Banaji (2007) have suggested, “performing self-report measures first may increase the accessibility of some cognition and affect subsequent IAT performance” (p. 273).³¹

When participants arrived to take the IAT, they were provided with a second consent form (see Appendix 10.1.4). The researcher then set up the IAT and the participant was asked to read the instructions (see Appendix 10.1.5), ask any questions, and to begin when they were ready. The researcher remained in the room, outside of the participant’s line of vision. Upon completion of the IAT, participants were asked for their perceptions of the IAT and the experiment before they were debriefed, thanked, and dismissed.

4.2.4 Results

Analyses were conducted in four phases. As recommended by Meade (2009), the internal consistency of the combined IATs was confirmed as $r = .64, p < .001$, calculated by correlating IAT scores at the end of the first half of stages 3 and 5 (pooled) with their IAT score for the latter half of stages 3 and 5 (pooled). When the correlations were examined by type of IAT, both showed satisfactory internal consistency: Valence $r = .80, p < .001$; Self/Other $r = .55, p < .05$. Next, the correlations between AGQ-R subscale scores and IAT scores were examined. This involved the standardization of IAT scores in terms of the counterbalanced conditions, signifying that a high score on both Self/Other Referent and Valence IAT meant the participant had been quicker to respond to Performance Goals and Self or Good (block 3), whereas a low score meant a quicker response to block 5, Mastery Goals and Self or Good. If the IAT scores reflected AGQ-R scores, Performance Approach (PAP) ratings would then be expected to correlate positively with overall IAT score, and negatively with Mastery Approach (MAP). However, neither correlation was significant (PAP: $r = .13, p = .44$; MAP: $r = -.07, p = .68$). Given that the IATs were designed to fit a

³¹ Although Hofmann, Gawronski, Gschwendner, Le and Schmidt’s (2005) meta-analysis of IAT studies suggested order (self-report then IAT, IAT then self-report) had little to no effect.

dichotomous achievement goal model, the last phase of analysis was to collapse PAP and Performance Avoidance (PAV) ratings into a single performance score (P_Avg). The same was done for MAP and Mastery Avoidance (MAV) to create M_Avg. These combined scores still showed no significant relation with IAT scores (P_Avg: $r = .09$, $p = .56$; M_Avg: $r = -.01$, $p = .93$).

To assess whether the lack of correlation was possibly a Type II error, a count was taken of the number of participants who showed a preference (faster reaction time) for Performance Goals or Mastery Goals in their IAT, and mapped against their highest ratings in AGQ-R, i.e., MAP or PAP (see Table 9).

Table 9. Cross-tabulation: Number of participants' IAT and AGQ-R responses

		Valence IAT		Total Participants
		Mastery	Performance	
AGQ-R	M_Avg	10	7	17
	P_Avg	12	7	19
	Total	22	14	36

Note. The table only shows data for 36 participants, as the four remaining participants had equivalent performance and mastery averages on the AGQ-R. AGQ-R = Achievement Goal Questionnaire-Revised, M_Avg = mean of mastery approach and avoidance subscales, P_Avg = mean of performance approach and avoidance subscales, IAT = Implicit Association Test.

The expected pattern of responding would have been for those who responded quickly to Mastery Goals on the IAT to have higher mastery ratings for their AGQ-R (and vice-versa for performance). The frequencies in Table 9 suggest this did not happen. The only indication of a trend was a slight preference for mastery during the IAT (22 versus 14 participants).

4.2.5 Discussion

The first research question for this study was, *can an implicit method for accessing achievement goals be designed?* The findings of this study answer yes, an implicit method can clearly be *designed*, in the form of an IAT. However, couched within this question are also the questions: is this method reliable and to what extent does an IAT score represent validly capturing of an individual's achievement goals?

In terms of the reliability of the two achievement goal IATs, the findings showed internal consistency for both measures (Hypothesis 1). The Valence IAT was more reliable than the Self/Other Referent IAT, and was also more in line with the split-half correlations and alphas ranging between .7 and .9 that were suggested by Nosek and colleagues (2007, p. 273). These findings suggest that the Valence IAT represents a promising tool to use in continued exploration of nonconscious achievement goals. One difficulty inherent in the design of the IATs was the potential for certain stimuli words to be interpreted differently by participants; for example, some participants revealed informally that they felt the word *persist* pertained more closely to the Performance Goals category. Although persistence has been linked with mastery goals (Elliot, McGregor, & Gable, 1999), continued piloting should explore more systematically the relationship between theorized and participants' category assignment of goal stimulus words. Similarly, an area that might merit further attention is finding alternative names for the goal categories, Performance Goals and Mastery Goals, given the unfamiliarity of these labels to most participants (but see Section 4.1.2).

The next question is whether what the IATs were measuring was actually representative of individuals' achievement goals. There are certain limitations of the IAT when comparing it to how achievement goals have been theorized. For example, the IAT is a measure of the relative association between two (goal) categories, whereas individuals may pursue multiple goals (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). Additionally, the IAT score is a static snapshot rather than a dynamic measure of achievement goals, with the implication that the IAT score represents a relatively stable goal association or preference. Furthermore, the IAT as an isolated computer categorization task lacks ecological validity when considering achievement goals at play in an achievement setting. However, the achievement goal IAT research programme is at a nascent stage, and with further research to increase the reliability of the IAT and assess its predictive power in relation to explicit methods and behavior, it will be possible to address each of these points. Multiple IATs presented in a row will potentially allow for incorporating approach and avoidance valences,

whereas goal manipulations might allow for the exploration of achievement goal IAT effect malleability in relation to situational variables.

At this early point, what is clear is that some individuals are quicker at categorizing performance (e.g., better, compete, overtake) and positive (e.g., joy, love, pleasure) stimulus words when Performance Goals and Good are paired than they are at categorizing mastery (e.g., learn, comprehend, progress) and positive words when Mastery Goals and Good are paired (and vice versa for mastery). These IAT scores thus show a stronger association between Performance Goals, as embodied by the performance stimulus words, and a positive valence. Greenwald and colleagues' (2002) extension of Heider's (1958) balance theory provides a *post hoc* explanation for IAT effects, suggesting, "interconnections among concepts are assumed to self-organize in ways that reflect cognitive consistency or balance" (Cvencek, Meltzoff, & Greenwald, 2011, p. 767). According to this reasoning and the available data from this study, it can be (only loosely) hypothesized that those individuals with a stronger Performance Goal-Good association are likely to implicitly prefer such behaviors (those embodied by the performance stimulus words) and thus pursue these goals in an achievement setting. Actual testing of such a prediction is necessary in helping to understand what exactly is represented by the IAT score, and is carried out in the next study.

A further point is how the Self/Other Referent and Valence IATs compare with the Like Me/Not Like Me method by Urdan and Cafasso (2011) and the IAT-T by Marzouq, Slade and Carr (2012). The IATs designed in this chapter improve on these two designs for two reasons. Firstly, in asking participants to assess the extent that a stimulus word is like them, Urdan and Cafasso's method seems to be capturing reaction times for essentially self-reported 'Like Me' decisions rather than implicit associations. Hence, while assessments of similarity to oneself, like self-reports, might be internally consistent on a Like Me method, they are unlikely to tap the implicit. By collecting reaction times based on associations rather than assessments of similarity to oneself, the IATs designed in this chapter are truly implicit. Secondly, in trying to address all four goals of the 2 x 2 achievement goal framework (Elliot & McGregor, 2001), the method designed by Marzouq and colleagues uses phrases, including double negatives

and different numbers of words, as the stimuli. Using phrases departs from IAT procedure of using single words and consequently presents a potential alternative explanation for differences in reaction times. In sum, the Self/Other Referent and Valence IATs designed in this chapter are closer in procedure and configuration to the original IAT (Greenwald, McGhee, & Schwartz, 1998), in addition to being internally consistent *and* tapping the implicit.

The second research question for this study was, *are there differences between what an implicit versus an explicit method can tell us about a student's goals, and if so, what are they?* The study found a lack of significant correlation between the IAT score and both the relevant AGQ-R subscale scores (PAP and MAP) and combined mean goal scores (i.e., P_Avg and M_Avg), thereby supporting Hypothesis 2. This suggests that there are differences between what the IAT and the AGQ-R are telling us. This dissociation is in line with earlier IAT studies such as Greenwald, McGhee and Schwartz (1998), though it differs from the findings of Hofmann and colleagues' (2005) meta-analysis, which showed a weak but positive average correlation between IATs and self-reports at $r = .24$. Hofmann and colleagues' (2005) meta-analysis only considered studies of attitudes, stereotypes, self-esteem, self-concept, and clinical applications (p. 1373). This study's finding of a lack of correlation between implicit-explicit methods is in line with more similar studies where IATs have been designed to assess motives or goals. For example, Brunstein and Schmitt's (2004) IAT for implicit motives was uncorrelated with the self-reported Achievement Orientation Scale at $r = -.07$, and Marzouq, Slade, and Carr's (2012) IAT-T for achievement goals did not correlate with the AGQ-R.

Exploring this divergence further, there are several potential reasons for the lack of correlation between the IATs and the AGQ-R in this study. One of these may be that the two methods are tapping into different aspects of the same construct. Keeping in mind the proposed conceptualization of the cognitive representation of achievement goals as part of a network of spreading activation among nodes, the IAT may capture the automatic associations, whereas the AGQ-R could capture a pattern among the same nodes but one that is slower and more deliberate. This would reflect a dual-process model. Accordingly, IATs may predict behavior (Asendorpf, Banse & Mücke, 2002;

Brunstein & Schmitt, 2004; Nosek, Banaji, & Greenwald, 2002) or socially sensitive issues (Greenwald et al., 2009), while self-report methods may predict subjective accounts (Brunstein & Schmitt, 2004) or less socially sensitive issues (Greenwald et al., 2009). This would suggest one answer to the second research question: IATs may illustrate an account of automatic, spontaneous behavior or cognition, whereas the AGQ-R may represent an account of more controlled, deliberate behavior. Ultimately, if such an explanation were supported in future studies, this would reinforce the value of employing both implicit and explicit methods in achievement goal research.

Another potential reason for the lack of correlation between the IATs and the AGQ-R in this study could be that the two methods are actually accessing different constructs. This was the approach taken by McClelland (McClelland, Koestner, & Weinberger, 1989) to explain the low correlations between implicit and explicit motive methods (but see Thrash, Maruskin, & Martin, 2012). A possible implication of this reasoning is that only one (or even neither) method employed in this study is validly capturing achievement goals. Given the argument made in the previous chapter regarding the potential for nonconscious achievement goals and the limits to self-report, the IAT may be closer to accessing the goals individuals are likely to pursue in achievement settings, whereas self-report achievement goal questionnaires may only be tapping into a type of conscious account, or *achievement narrative*. This narrative would reflect the conscious experience of achievement situations, retain a relative consistency over time and across situations,³² and could be drawn on to inform responses to self-report measures on a range of related concepts such as use of deep or surface learning strategies, persistence, help-seeking, and self-handicapping, thereby potentially resulting in the correlations that have been observed in self-report achievement goal research (e.g., Elliot, McGregor, & Gable, 1999; Midgley & Urdan, 2001; Ryan & Pintrich, 1997; Pintrich, Smith, Garcia, & McKeachie, 1993). An interesting counterpoint is Hofmann and colleagues' (2005) finding regarding the systematic relatedness between IATs and self-report methods in 126 studies. There is clearly a need for

³² Presenting a potential explanation for the strong (e.g., .40-.70) test-retest correlations for mastery and performance goals observed by Senko, Hulleman, and Harackiewicz (2011, p. 33).

more research exploring the achievement goal IATs, including the testing of alternative category titles for performance (e.g. “Appearing Competent” or “Comparing Competence”) and mastery goals (e.g., “Improving Understanding” or “Developing Competence”), and other implicit methods (e.g., visual stimuli showing images of everyday achievement situations such as giving a presentation to peers), in comparison with self-reports such as the AGQ-R. Such comparison should be especially useful in highlighting how these different methods relate to achievement-relevant behavior.

4.3 Conclusion

This study showed that both newly designed IATs were internally consistent, with the Valence IAT suggested for use in continued exploration of potentially nonconscious achievement goals. There were no significant relationships between IAT and the AGQ-R. Fine-grained supplementary analysis demonstrated that those participants who showed a preference for a goal (either mastery or performance) on the IATs did not generally show the same preference in their ratings on the AGQ-R.

Different explanations for these findings were then suggested, but more research is required to shed light on which of these may be more likely. Ultimately, studies that explore these explanations will have implications for how achievement goal researchers can begin to incorporate the notion of the unconscious into how they theorize and capture achievement goals. At this early point, however, one way in which to investigate these varying explanations is by comparing how these implicit and explicit methods relate to students’ behavior on an achievement task, as is explored in the next study.

5 Study 2 Does achievement behavior indicative of mastery or performance goals correspond to implicit or explicit accounts?

Introduction

This chapter follows on from Study 1 in addressing aim 3b of the thesis, to *assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through designing and running a series of studies to empirically test if achievement goals can operate and be captured without conscious awareness*. Specifically, this is done in terms of 3b(ii), *conducting a comparison between achievement behavior and implicit and explicit achievement goal methods*. In other words, will an implicit or explicit achievement goal method be more consistent with a student's achievement behavior? Study 2 adds achievement behavior into the comparison of implicit and explicit methods made in Study 1, in order to assess whether one method, both methods, or neither method is related to participants' actual behavior on an achievement task.

In Study 2, fifty participants completed an induced failure anagrams achievement task, reflected on it in terms of their affect and intrinsic motivation using self-report questionnaires, and finally completed either the explicit Achievement Goal Questionnaire-Revised (AGQ-R, Elliot & Murayama, 2008) or the Valence IAT designed in Chapter 4. Participants' persistence on the anagrams task was categorized according to a theorized pattern of differences between performance and mastery oriented individuals and then compared with their affect and intrinsic motivation self-reports, and also with their responses to the AGQ-R or the Valence IAT. The findings of Study 2 are then discussed before the scene is set for Study 3, which attempts to manipulate the goal behavior using a nonconscious priming procedure.

5.1 Background

As laid out in Chapter 3, research has shown that when asked about the reasons behind their behavior and decision-making, participants often tell more than they can know (e.g., Nisbett & Wilson, 1977; Wegner, 2002), and tell when they

cannot know (e.g., Bargh & Chartrand, 1999; Bargh, Chen, & Burrows, 1996). Such findings challenge the assumption that achievement goals are largely conscious and accessible, but also imply that achievement goal theory researchers may need to use more than just self-report data to fully understand students' goals for studying (Murayama, Elliot, & Friedman, 2012; Pintrich, 2003).

Recently, steps have been taken towards developing implicit measures of achievement goals. While some have explored the use of traces in online learning environments (Winne, 2010; Zhou & Winne, 2012), others have looked to achievement goal versions of the Implicit Association Test (IATs, Greenwald, Schwartz, & McGhee, 1998), resulting in the design of the Like Me/Not Me measure by Urdan and Cafasso (2011) and the IAT-Type achievement goal measure by Marzouq, Slade and Carr (2012).

Study 1 illustrated the design and testing of two original achievement goal IATs, the Self/Other Referent IAT and the Valence IAT. The Valence IAT demonstrated the greater internal consistency of the two,³³ and as such was selected for continued methodological study in this thesis. Interestingly, the IATs were unrelated to participants' explicit self-reports about their achievement goals collected via the AGQ-R. Possible explanations for this latter finding included the suggestion that the implicit and explicit methods might be accessing two different aspects of a single underlying construct, or two independent constructs. The current study is carried out to begin to shed light on which of these explanations might be more likely, and as such compares participants' behavior on an achievement task with their responses to the Valence IAT and AGQ-R. Furthermore, it should help elucidate what the newly designed IAT is measuring, as well as which method, both, or neither, represents a valid means of capturing the achievement goals students pursue on achievement tasks.

The aims of the study are thus to continue exploring the reliability of the Valence IAT (Aim 1), to compare participant behavior on an achievement task with their Valence IAT score (Aim 2), and to compare participant behavior on an

³³ Although both original IATs demonstrated appropriate internal consistency.

achievement task with their AGQ-R subscale scores (Aim 3). As mentioned in the introduction, the overarching question guiding this research program is: *Are the implications of research on implicit cognition applicable to achievement goal theory?* (Research Question 3) Given that one of the implications of research on implicit cognition is the limited ability for introspection and self-report, this study should provide more information on whether this is the case for achievement goals. More specifically, the research question for this study was: *will an implicit or explicit achievement goal method be more consistent with a student's achievement behavior?*

5.1.1 Selection of an achievement task

In order to conduct this comparison, it was vital to find a task that could adequately represent an achievement situation and elicit participants' achievement goals. One area that has had the same requirement is research on priming the goal *to achieve*. For example, in a study by Bargh, Gollwitzer, Lee-Chai, Barndollar, and Trötschel (2001), the researchers were interested in whether goals could be nonconsciously activated. They wondered if priming participants with the goal *to achieve* would lead primed participants more than non-primed participants to work toward accomplishing an achievement task, cause them to persist when encountering obstacles, and push them to continue working after disruption. Hence, the researchers needed a task that could highlight goal-directed behavior, and specifically, behavior that was consistent with achieving. In experiments 4 and 5, Bargh and colleagues (2001) thus created a task in which participants were presented with a set of Scrabble tiles and told to find and note down as many words as they could within a two-minute period (experiment 4) or until they could find no more (experiment 5). Although not a typical achievement task, it did elicit goal-directed, achievement-related behavior. As such, it was deemed appropriate to adopt a similarly informal achievement task for the current study.

However, while Bargh and colleagues' (2001) studies needed to distinguish between whether the participant was clearly goal-driven or not (i.e., did they keep working to achieve the highest amount of words even when they were told to stop working over an intercom? Did they keep working on an intellectually

demanding task after a disruption and given the chance to work on a more intrinsically enjoyable task?), the achievement task required for this study needed to provide an adequate point of comparison with the implicit and explicit methods. This was translated into needing to be able to distinguish between performance and mastery goal directed behavior, in line with the dichotomous Valence IAT, and the AGQ-R (i.e., PAP subscale score, MAP subscale score, combined P_Avg score, combined M_Avg score).

Early studies of dichotomous achievement goals posited that one way that performance and mastery oriented individuals differ is in their responses to failure (Diener & Dweck, 1978, 1980; Dweck, 1986). Indeed, Dweck (1986) reviewed research showing that while individuals “with learning goals tend to use obstacles as a cue to increase their effort or to analyze and vary their strategies” (p. 1042), performance oriented individuals’ “confidence in their ability needs to remain high to sustain task involvement...[and] they attribute errors or failures to a lack of ability...[which] tends to result in defensive withdrawal of effort or debilitation in the face of obstacles” (p. 1042). These responses to failure were also linked with affect and intrinsic motivation: pursuing a performance goal in a failure situation would not allow a performance oriented individual to demonstrate their competence and would therefore undermine their intrinsic interest and positive affect, whereas the expenditure of effort by the mastery oriented individual would be linked with feelings of satisfaction and would not undermine their intrinsic interest in the task (Dweck, 1986, p. 1042).

More recent accounts of achievement goals of course distinguish between the approach and avoidance valences of achievement goals, with studies such as Elliot and Harackiewicz (1996) suggesting that it is the endorsement of performance *avoidance* goals, rather than performance approach goals, that is linked with lower intrinsic motivation and maladaptive achievement behaviors. However, Senko, Hulleman and Harackiewicz (2011) have ceded that performance approach goals may over time indirectly leave individuals “vulnerable” to performance avoidance goals, a possibility “first offered by Nicholls (1984), who posited that students pursuing performance goals would respond to failure experiences by switching to performance-avoidance goals,

thus incurring all the educational hazards of the latter goals” (p. 33). Senko and colleagues (2011) note that others also seem to endorse this possibility (Bong, 2005; Brophy, 2005; Kaplan & Maehr, 2007; Midgley et al., 2001; Molden & Dweck, 2000; Roeser, 2004; see also experiment 1, Senko & Harackiewicz, 2005). In a recent meta-analysis, Huang (2012) has indeed linked performance avoidance goals with maladaptive strategies such as lack of persistence, while in a meta-analysis of achievement goals and emotions, the same author (Huang, 2011) found links between mastery goals and positive affect and performance avoidance goals and negative affect. As such, the decision was made to use an induced failure situation in order to distinguish the persistence, affect, and intrinsic motivation responses of those pursuing performance goals from those pursuing mastery goals.

One recent study that has used a failure situation in order to compare achievement goals is the study by Sideridis and Kaplan (2011). The researchers used a puzzle task of seven wooden pieces that needed to be formed into specified geometrical shapes, within a design comprising a series of five puzzles: the first three were unsolvable, the fourth was solvable and acted as a hope probe, and the fifth was again unsolvable. The researchers found that participants who endorsed mastery approach goals on a self-report achievement goal questionnaire (Elliot & Church, 1997) persisted significantly longer (in terms of amount of time and number of trials) on the first three unsolvable anagrams than those who had endorsed performance approach, performance avoidance and amotivation goals.³⁴ As such, this task allowed for a clear distinction to be made between the overall greater persistence behavior of mastery versus performance oriented participants.

³⁴ Sideridis and Kaplan (2011) also found that performance approach oriented individuals showed a rebound effect on the fifth puzzle unlike the other groups. The researchers suggested this may have been because once performance approach oriented participants had had an opportunity to demonstrate their competence on the fourth, solvable puzzle, the time and trials they expended on the fifth puzzle reflected their pre-failure persistence. Given that this finding was unexpected, and its explanation tentative and requiring further study in a replication, this aspect of Sideridis and Kaplan’s (2011) analysis was not included in the current study.

For the current study, it was decided that the puzzles used by Sideridis and Kaplan (2011) would be replaced by anagrams, but that the failure paradigm would be retained. Anagrams represent a relatively common achievement task to assess achievement goal behavior and distinguish between different goals. Indeed, Utman's (1997) meta-analysis of the effects of goals on task performance showed other studies that had used anagrams when exploring a dichotomous achievement goal framework (e.g., Dyck & Breen, 1974; Trzebinski, 1974). More recently, Ciani and Sheldon (2010) employed anagrams as their dependent variable when using the letters A and F to prime students' approach and avoidance motivation, while Elliot and colleagues (Elliot, Maier, Moller, Friedman, & Meinhardt, 2007) used anagrams as the achievement task in a series of experiments testing the effects of priming the color red on students' avoidance-based motivation. Given the propensity for Sideridis and Kaplan's (2011) failure-inducing puzzle task to distinguish between the different goals and the prevalence of using anagrams as worthwhile achievement tasks, a task combining induced failure and anagrams was selected for comparing mastery and performance goal-directed behavior with the Valence IAT and the AGQ-R.

5.2 Hypotheses

It was predicted that some participants would persist longer, defined in terms of time spent and attempts made on each anagram, and also maintain greater intrinsic motivation and positive affect in the face of failure on the anagrams task than others. Given the above findings (Dweck, 1986; Huang, 2011, 2012; Senko, Hulleman, & Harackiewicz, 2011; Sideridis & Kaplan, 2011), it was expected that these individuals would be embodying mastery goal behavior. Those persisting for less time and making fewer attempts, in addition to reporting lower intrinsic motivation and higher negative affect, would be embodying performance behavior.

Given the potential explanation of the dual process model suggested in the last chapter (Study 1), where spontaneous, automatic behavior is theorized to be linked with implicit methods, the second hypothesis for this study was that the mastery and performance persistence behavior of participants would

correspond better with their subsequent Valence IAT scores than with their conscious, explicit self-reported AGQ-R (PAP, MAP, P_Avg, M_Avg).

In summary, the hypotheses for Study 2 were that:

1. *Some participants will persist more (time and attempts) in the face of failure than others, embodying a mastery response*
2. *Those who persist more (mastery group) will also report higher positive affect and intrinsic motivation than those who persist less (performance group)*
3. *The Valence IAT will be more consistent with participants' persistence behavior than the AGQ-R*

5.3 Method

5.3.1 Participants

Participants were 50 students enrolled in different faculties at a university in the northeast of England. There were 25 female and 25 male students in the sample. 12 participants were undergraduates (years 1-4), and the remaining 38 were postgraduates (Masters and PhD students). All participants were contacted personally by the researcher and asked if they would like to volunteer their participation.

5.3.2 Materials

5.3.2.1 Achievement Behavior Task

The achievement task, as outlined above, consisted of a series of five anagrams. All the anagrams were chosen from a list of difficult anagrams (Remedios, 2000), so that participants would not easily realize they were unsolvable. The four unsolvable anagrams were made unsolvable by adding an extra letter that would prevent their solution. The anagrams used are displayed in Table 10.

Table 10. Anagrams

No.	Type	Original Anagram	Original Solution	Added Letter	Anagram w/ added letter
1	Unsolvable	EEGBCRI	ICEBERG	K	EKEGBCRI
2	Unsolvable	ACTIONAR	RAINCOAT	F	ACTIONARF
3	Unsolvable	CAMMSIEHN	MECHANISM	D	CAMMDSIEHN
4	Solvable	TOBUNT	BUTTON	-	-
5	Unsolvable	YRBEREW	BREWERY	U	UYRBEREW

Anagrams were written in capitalized letters using black ink on four-by-one-inch pieces of white paper that were folded so as to conceal each anagram. On the outside of the paper was a small, circled number indicating the place of each anagram in the order from anagrams one to five. To access the anagram letters, participants needed to open the folded piece of paper. Participants were provided with an answer sheet (see Appendix 10.2.1), a pen, and a pile of blank A4 scrap paper.

5.3.2.2 Self-Report Achievement Goal Measure

As in the previous study, Elliot and Murayama's (2008) 12-item Achievement Goal Questionnaire-*Revised* (AGQ-R) formed the explicit, self-report method for participants' achievement goals. As before, the questionnaire comprised four subscales: Performance Approach (PAP, 3 items; $\alpha = .92$), Performance Avoidance (PAV, 3 items; $\alpha = .81$), Mastery Approach (MAP, 3 items; $\alpha = .68$), and Mastery Avoidance (MAV, 3 items; $\alpha = .72$). Participants responded on a scale from 1 (strongly disagree) to 5 (strongly agree).

5.3.2.3 Implicit Achievement Goal Measure

Also as in the previous study, the Valence Implicit Association Test (Valence IAT) represented the implicit measure, with two valence categories, 'Good' and 'Bad', and two goal categories, 'Performance Goals', and 'Mastery Goals'. Category labels and stimuli were identical to those used in Study 1. As before, the IAT was counterbalanced in order to eradicate any potential ordering effects. Hence, half of the total sample of participants was presented with the 'Performance Goals' and 'Good' pairing in the first combined categories block (block 3) and the 'Mastery Goals' and 'Good' pairing in the second combined categories block (block 5), while the other half of the sample received the inverse.

5.3.2.4 Affect and Intrinsic Motivation

Further information about the participants' experience of the achievement task was elicited using the brief 20-item Positive and Negative Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988, see Appendix 10.2.2). Participants were asked to rate different feelings and emotions (e.g., *distressed*, *enthusiastic*, *irritable*, etc.) in terms of the extent to which they experienced them on the achievement behavior task. The subscales consisted of Positive Affect (10 items; $\alpha = .79$) and Negative Affect (10 items; $\alpha = .81$). Participants responded using a scale from 1 (*very slightly or not at all*) to 5 (*extremely*).

Participants' experience of the achievement task was also assessed using their responses to the Interest and Enjoyment (7 items; $\alpha = .84$), Perceived Competence (6 items; $\alpha = .80$), and Effort and Importance (5 items; $\alpha = .73$) subscales of the Intrinsic Motivation Inventory (IMI, Ryan, 1982, see Appendix 10.2.3). Participants rated items such as "I enjoyed doing this activity very much" (Interest and Enjoyment), "I am satisfied with my performance at this task" (Perceived Competence), and "I tried very hard on this activity" (Effort and Importance) on a scale of 1 (*not at all true*) to 7 (*very true*). Verbalizations were also informally recorded in the form of notes taken by the researcher while the participant worked on the task.

5.3.3 Procedure

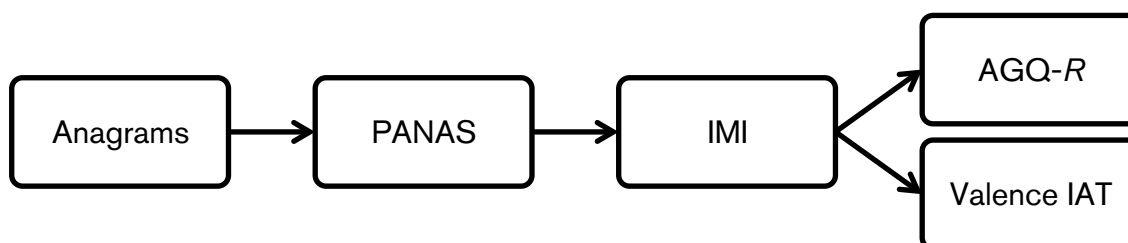


Figure 9. Study 2 methods

An overview of the procedure is illustrated in *Figure 9*. All participants were run individually, in a room free from noise and distractions. After filling out a consent form (see Appendix 10.2.4), participants were asked to complete the

series of five anagrams. At this point, the researcher asked if the participant knew what an anagram was and clarified for those who were confused or wanted to check to be sure. The researcher then pointed out the pile of numbered folded pieces of paper with anagrams inside, some blank scrap paper on which they could do work if they so desired, and the lines on the answer sheet on which they should write solutions to each of the five anagrams. The researcher informed participants that they should proceed in order from anagrams one to five, that they could spend as much time as they wanted on each of the anagrams and move at their own pace, but that once they had closed and set an anagram aside, they could not return to it. Participants were told that if they arrived at the solution, they should write it down next to its corresponding number on the answer sheet, and that if they wanted to move on from one that they had been unsuccessful in solving, they could just draw a dash next to the number.

While the participants were working, the researcher surreptitiously timed how long participants spent working on each anagram. The researcher noted the times that the participant opened and later folded closed again each numbered piece of paper on which the anagrams were written. The researcher also wrote down any verbalizations made by the participants, starting from when they began the anagrams task until they moved on to the post-anagram questionnaires.

Once the participants stated that they were ready to move on from the anagrams task, the researcher collected any scrap paper they had used for their attempts, and handed them the PANAS and the IMI. They were asked to do the PANAS first and then the IMI. Participants were instructed to keep the anagrams task in mind while filling out both questionnaires. When participants had completed the questionnaires, the researcher administered either the Valence IAT or the AGQ-R.

The question of how to allocate participants to Valence IAT or AGQ-R group was carefully considered given that by chance random allocation might result in all mastery participants ending up taking the Valence IAT and all performance participants ending up in the AGQ-R group. Although this was not crucial to

comparing whether the achievement goal method was consistent with the persistence behavior, a mix was desired between mastery and performance participants and implicit and explicit achievement goal methods.

One way of dealing with this issue was to assess, during the anagram task, whether the participant's behavior was akin to that observed in Sideridis and Kaplan's (2011) study. Sideridis and Kaplan had found that performance participants spent longer on the final anagram in comparison to their time spent on each of the first three anagrams and that mastery participants spent less time on the final anagram than they had, as they spent less time progressively through the anagrams. If an estimate of these goal orientations could be made while the participant was working on the PANAS and IMI, the researcher might be able to balance out allocation of performance and mastery participants to Valence IAT and AGQ-R conditions. However, this procedure was deemed too impractical.

Ultimately, participants were allocated somewhat randomly. Given that participants were volunteers and some had a limited amount of time to offer (i.e., maximum of 1 hour), the researcher tended to choose the generally quicker option (the 12-item AGQ-R) so that these participants could complete the experiment and not be unnecessarily inconvenienced as a result of their participation in the research. Allocation was therefore loosely randomized (see Appendix 10.2.5 for eventual order), in that participants differed by chance in terms of how much time they could offer to participate and spent varying amounts of time on the anagrams task. In this way, 25 volunteers were ultimately allocated to the AGQ-R condition, whereas the remaining 25 participants completed the Valence IAT.

When participants finished the explicit self-report or implicit achievement goal measure, the researcher debriefed them in full.³⁵ In accordance with suggestions made during the ethics review for this study, given the limited information provided during recruitment, the covert measurement of persistence behavior, and the implicit nature of the measurement on the Valence IAT, the researcher explained why this had been necessary (i.e., to

³⁵ For those who had to leave directly after finishing, the researcher sent a full debrief by email.

avoid influencing participant persistence behavior). The researcher also explained that all but one of the anagrams was unsolvable, and that even the solvable one came from a list of difficult anagrams, so no participant would leave the room feeling disappointed in their performance. The researcher presented participants with the opportunity to access their time per anagram and any notes that the researcher had covertly made on their verbalizations during the task, and answered any remaining questions participants had. Finally, participants were thanked and dismissed.

5.4 Results

5.4.1 Preliminary Analyses

5.4.1.1 Reliability of the Valence IAT

The reliabilities of each of the self-report measures have been reported above (in Materials, Section 5.3.2), and largely showed appropriate internal consistency. Half of the sample took the Valence IAT. Study 1 described calculating the reliability of the IAT by splitting the IAT into two halves and assessing the strength of their correlation (Meade, 2009). For this study, in which the first aim was to continue to assess the reliability of the Valence IAT, the calculation revealed that the Valence IAT was again internally consistent, $r = .62, p < .01$.

5.4.1.2 Treatment of the Achievement Goal Methods

Correspondence between persistence and the AGQ-R was carried out using Performance Approach subscale means (PAP) and Mastery Approach subscale means (MAP). In addition, as in Study 1, performance subscales were averaged into a combined performance score (P_Avg), and the same was done for mastery subscales (M_Avg). Furthermore, given that the blocks of the Valence IAT had been counterbalanced throughout their administration, these were now standardized so that a positive and higher IAT effect reflected a performance preference and a negative and lower IAT effect reflected a mastery preference.

5.4.1.3 Treatment of the Persistence Indicators

There were two measures of persistence behavior. One measure was the time each participant spent on each anagram, computed from the times that each participant opened and closed each anagram. In terms of *total time spent on all five anagrams*, participants ranged from spending around nine minutes to approximately ninety minutes, with a mean time of about twenty-eight minutes. The other measure of participant persistence behavior was the *amount of attempts participants had made on each anagram*, derived from the scrap paper on which they did their working out. An attempt represented the number of times a series of anagram letters was written anew. In terms of total attempts made across the five anagrams, participants ranged from making no visible attempts to 195 attempts, with a mean of around forty-five. Out of the fifty participants, thirty-nine got the fourth anagram (BUTTON) correct, representing 78% of the sample.

Given the achievement task design of three unsolvable anagrams, a solvable anagram, and then a final unsolvable anagram, running analyses at the level of total time spent on anagrams in order to distinguish persistence behavior between participants who reported a performance or mastery orientation on the AGQ-R or IAT would not make sense. Sideridis and Kaplan's (2011) study, from which the achievement task procedure was adapted, instead suggested a *between-trial level* analysis. As such, persistence averages were calculated on the basis of anagrams 1-3 because all of these anagrams were unsolvable and thus allowed for the observation of participants' responses to a failure situation.

Furthermore, given that the hypotheses and aims of the study required assessing if persistence behavior was linked with affect and intrinsic motivation (Hypothesis 2) and corresponded with the achievement goal methods (Aims 2 and 3, Hypothesis 3), a decision had to be made for how to categorize participants' persistence behavior as performance or mastery. Out of several possible ways of conducting this categorization, two ways are used in the analysis described here, and another is included in the appendix (see Appendix

10.2.6).³⁶ Both of the ways described here involved dividing the sample into performance and mastery via a median split. As there were two persistence indicators, one median split was conducted based on average amount of time spent on anagrams 1-3, and the other median split was conducted based on average number of attempts made on anagrams 1-3.

Beginning with persistence behavior in terms of *average time* spent on anagrams 1-3, the median was calculated at 285.33 seconds (almost five minutes). As such, the behavior of all participants who spent less time than this on average for anagrams 1-3 was categorized as displaying a performance goal. Similarly, the behavior of all participants who spent more time than the median on average for anagrams 1-3 was categorized as displaying a mastery goal. This median split divided the sample neatly in half, such that there were 25 participants in the performance group and 25 participants in the mastery group. The means for time spent and attempts made on anagrams 1-3 for performance and mastery groups are shown in Table 11 below. An independent samples t-test found both of the differences in means to be at statistical significance (time spent, $t(48) = -6.591, p < .001, d = -1.86$; attempts made, $t(48) = -4.524, p < .001, d = -1.28$). As such, according to this persistence categorization approach, some participants persisted statistically significantly longer than others (Hypothesis 1).

³⁶ The analysis laid out in the appendix is the original analysis. The original analysis worked backwards, on the basis of whether participants had reported or reacted mastery (group a) and reported or reacted performance (group b). These two groups were examined in terms of whether there were significant differences across group means for average time spent on anagrams 1-3, average attempts made on anagrams 1-3, and PANAS and IMI responses. This analysis involved a comparison of means and a factorial ANOVA, and found that no clear patterns emerged. Those who endorsed or reacted quickly to mastery spent slightly longer and made slightly more attempts on average than those who had endorsed or reacted more quickly to performance, but this difference did not reach statistical significance. However, this analysis did not seem to directly test whether the implicit and/or explicit method adequately reflected the theorized differences in behavior expected of performance and mastery oriented individuals (the research question). Hence, the currently described analysis was conducted, using a median split, beginning with participant behavior rather than how individuals had responded/reacted to the AGQ-R or Valence IAT.

Table 11. Mean persistence by group (time persistence median split)

Group	<i>n</i>	Mean Time Spent on Anagrams 1-3		Mean Attempts Made on Anagrams 1-3	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance	25	218.35	47.69	5.25	3.07
Mastery	25	599.96	285.56	15.05	10.39
Total	50	409.15	279.65	10.15	9.05

Note. Group = membership based on median split according to average time spent on failure anagrams 1-3, Mean Time on Anagrams 1-3 is in seconds, *n* = number of participants per condition, *M* = mean, *SD* = standard deviation.

Continuing with participant persistence behavior in terms of *average attempts* made on anagrams 1-3, the median was calculated at 7 attempts. As such, the behavior of participants who made fewer attempts than this on average for anagrams 1-3 was categorized as displaying a performance goal. Again, the behavior of all participants who made more attempts than this on average for anagrams 1-3 was categorized as displaying a mastery goal. This median split divided the sample nearly in half, such that there were 26 participants in the performance group and 24 participants in the mastery group. The means for time spent and attempts made on anagrams 1-3 for each of these groups are shown in Table 12 below. An independent samples t-test found both of the differences in means to be at statistical significance (time spent, $t(48) = -4.040$, $p < .001$, $d = -1.13$; attempts made, $t(48) = -6.329$, $p < .001$, $d = -1.76$). As such, this persistence categorization approach also found that some participants persisted statistically significantly more than others (Hypothesis 1).

Table 12. Mean persistence by group (attempts persistence median split)

Group	<i>n</i>	Mean Time Spent on Anagrams 1-3		Mean Attempts Made on Anagrams 1-3	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance	26	275.18	139.83	4.35	1.97
Mastery	24	554.29	321.07	16.44	9.54
Total	50	409.15	279.65	10.15	9.05

Note. Group = membership based on median split according to average attempts made on failure anagrams 1-3, Mean Time on Anagrams 1-3 is in seconds, *n* = number of participants per condition, *M* = mean, *SD* = standard deviation.

The subsequent analyses draw on both of these median split approaches in exploring whether persistence behavior was in line with the theorized patterns of affect and intrinsic motivation (Hypothesis 2), and then whether persistence

behavior was more consistent with participants' reactions on the Valence IAT than with their responses on to the AGQ-R (Hypothesis 3).

5.4.2 Links between persistence behavior, affect, and intrinsic motivation

The second hypothesis for this study was that those whose persistence behavior was more indicative of mastery goals would have higher ratings of positive affect and intrinsic motivation than those whose persistence behavior was more indicative of performance goals. The sections below explore whether this was the case according to each of the median split persistence behavior categorizations.

5.4.2.1 Time persistence, affect, and intrinsic motivation

In order to compare time persistence and affect, the ratings for all positive and all negative affect items were summed to create separate positive and negative affect subscale scores ranging between 10 (answering 1 for each item) and 50 (answering 5 for each item). The mean scores for the positive and negative affect subscales are presented in Table 13 and displayed in *Figure 10*.

Table 13. Affect means by group (time persistence median split)

Group	<i>n</i>	Positive Affect		Negative Affect	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance	25	25.36	6.18	19.24	5.80
Mastery	25	25.72	5.24	20.56	6.95
Total	50	25.54	5.67	19.90	6.37

Note. Group = membership based on median split according to average time spent on failure anagrams 1-3, *n* = number of participants per condition, *M* = mean, *SD* = standard deviation.

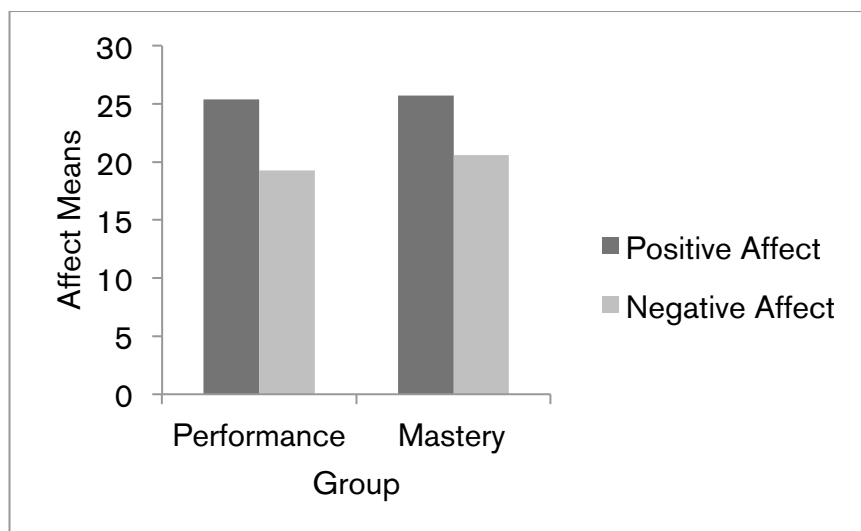


Figure 10. Affect means by group (time persistence median split)

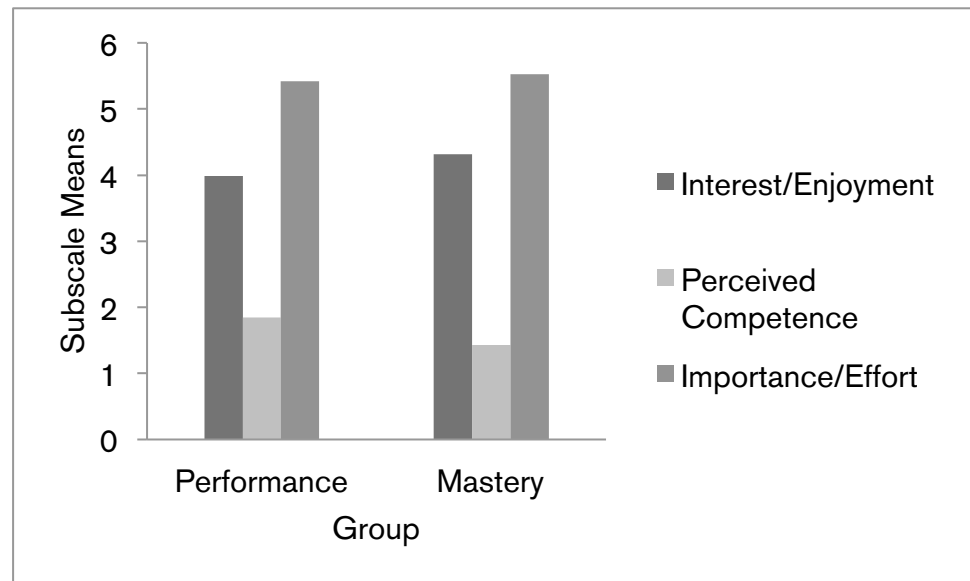
As predicted (Hypothesis 2), the positive affect mean was indeed higher for those in the mastery goal group than for those in the performance goal group. However, as shown in Table 13, this difference between the performance goal group and the mastery goal group was small and failed to reach statistical significance when tested using an independent samples t-test ($t(48) = -.222, p = .825, d = -0.06$). Interestingly, the mastery goal group also had a higher negative affect mean than those in the performance goal group, the inverse of what was predicted according to theorized patterns of response to induced failure. Again, however, this difference between the performance and mastery goal groups failed to reach significance ($t(48) = -.729, p = .469, d = -0.21$). As such, according to categorization based on average time spent on anagrams 1-3, the findings failed to show statistically significant differences in affect for the performance and mastery goal groups.

In order to compare time persistence and intrinsic motivation, the ratings for the interest and enjoyment, perceived competence, and importance and effort subscale scores were averaged. The means for each intrinsic motivation subscale are presented in Table 14, and visualized in *Figure 11*.

Table 14. Intrinsic motivation means by group (time persistence median split)

Group	Interest/Enjoyment		Perceived Competence		Importance/Effort	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance	3.99	1.06	1.85	0.92	5.42	0.63
Mastery	4.32	0.87	1.43	0.50	5.53	0.89
Total	4.15	0.97	1.64	0.76	5.48	0.77

Note. *M* = mean, *SD* = standard deviation.

**Figure 11. Intrinsic motivation means by group (time persistence median split)**

As predicted (Hypothesis 2), the interest and enjoyment and importance and effort means were indeed higher for those in the mastery goal group than those in the performance goal group (see Table 14). However, neither of these differences between the performance and mastery groups reached significance (interest and enjoyment, $t(48) = -1.209$, $p = .232$, $d = -0.34$; importance and effort, $t(48) = -.476$, $p = .636$, $d = -0.14$). Interestingly, those in the performance goal group reported higher perceived competence than those in the mastery goal group, and here the difference in means was at statistical significance ($t(48) = 2.007$, $p = .05$, $d = 0.57$). As such, according to categorization based on average time spent on anagrams 1-3, the findings failed to show statistically significant differences in line with the predictions for interest and enjoyment and importance and effort for the performance and mastery goal groups. The findings did, however, show a statistically significant difference between the groups in terms of perceived competence, which departs from the predicted

pattern of higher intrinsic motivation for those in the mastery goal group (Hypothesis 2).

5.4.2.2 Attempts persistence, affect, and intrinsic motivation

The means for positive and negative affect across the performance and mastery groups according to categorization based on attempts persistence is shown in Table 15 and visualized in *Figure 12*.

Table 15. Affect means by group (attempts persistence median split)

Group	<i>n</i>	Positive Affect		Negative Affect	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance	26	24.62	6.53	19.88	5.38
Mastery	24	26.54	4.49	19.92	7.41
Total	50	25.54	5.67	19.90	6.37

Note. Group = membership based on median split according to average attempts made on failure anagrams 1-3, *n* = number of participants per condition, *M* = mean, *SD* = standard deviation.

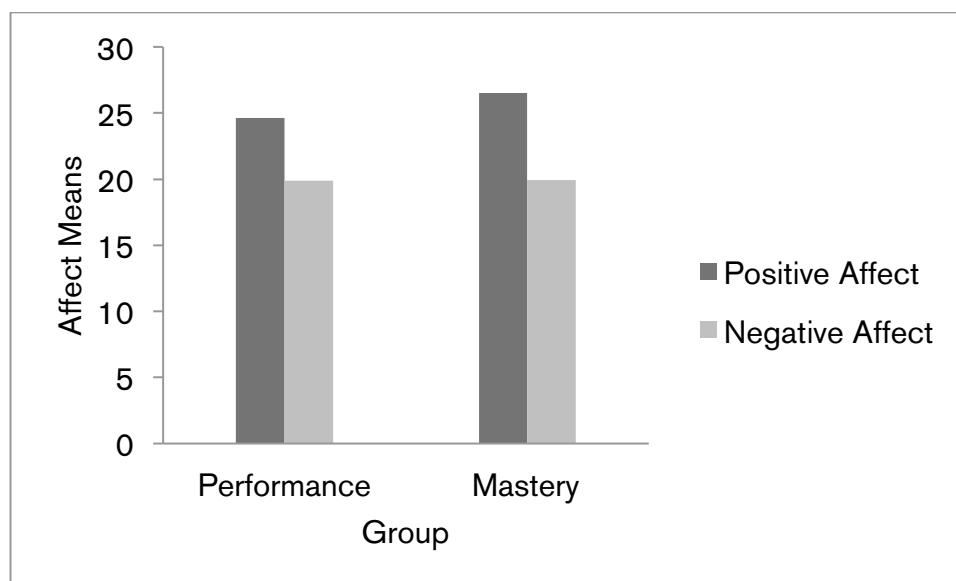


Figure 12. Affect means by group (attempts persistence median split)

As predicted (Hypothesis 2), those in the mastery group indeed reported greater positive affect than those in the performance group. However, the differences in group means across the performance and mastery groups failed to reach significance ($t(48) = -1.205, p = .234, d = -0.34$). The performance and mastery groups also had similar means for negative affect ($t(48) = -.018, p = .986, d = -0.01$, see Table 15). As such, according to categorization based on average

attempts made on anagrams 1-3, the findings were more in line with the predictions than categorization according to average time spent on anagrams 1-3, but failed to show statistically significant differences in affect for the performance and mastery goal groups.

In order to compare attempts persistence and intrinsic motivation, the IMI subscale scores were averaged. Means for each subscale are shown for the performance and mastery goal groups in Table 16 and *Figure 13*.

Table 16. Intrinsic motivation means by group (attempts persistence median split)

Group	<i>n</i>	Interest/Enjoyment		Perceived Competence		Importance/Effort	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance	26	3.97	0.96	1.72	0.89	5.38	0.67
Mastery	24	4.35	0.97	1.54	0.60	5.58	0.86
Total	50	4.15	0.97	1.64	0.76	5.48	0.77

Note. Group = membership based on median split according to average attempts made on failure anagrams 1-3, *M* = mean, *SD* = standard deviation.

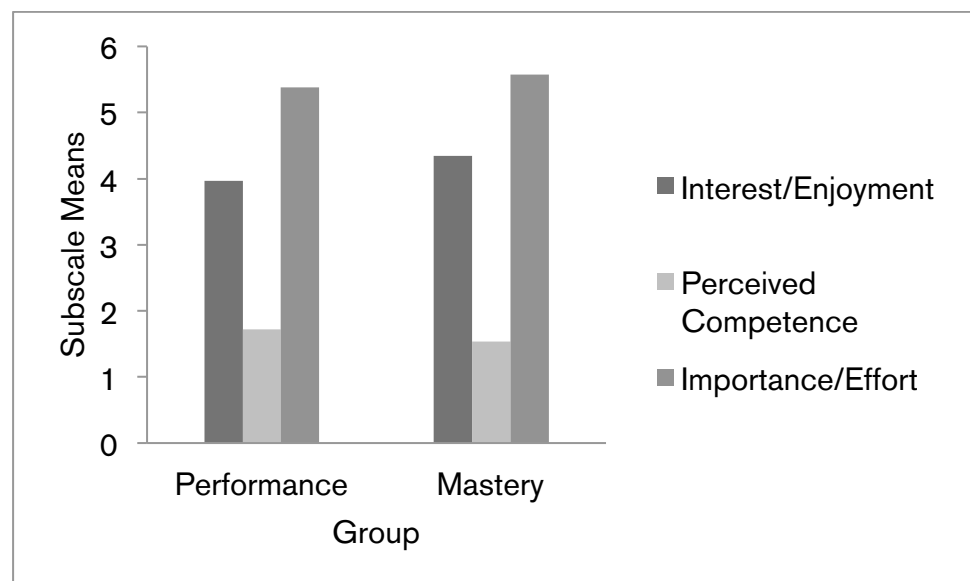


Figure 13. Intrinsic motivation means by group (attempts persistence median split)

As predicted (Hypothesis 2), the interest and enjoyment and importance and effort means were again indeed higher for those in the mastery goal group than those in the performance goal group. However, again, these differences across the performance and mastery groups failed to reach significance (interest and enjoyment, $t(48) = -1.387, p = .172, d = -0.39$; importance and effort, $t(48) = -.950, p = .347, d = -0.26$). As in the time persistence categorization, those in the

performance goal group reported higher perceived competence than those in the mastery goal group, but this difference failed to reach statistical significance ($t(48) = .844, p = .403, d = 0.24$) for this categorization approach. As such, according to categorization based on average attempts made on anagrams 1-3, the findings failed to show statistically significant differences in line with the predictions for all three of the IMI subscales. Although the group means for the interest and enjoyment and importance and effort subscales moved in the right direction, the group means for perceived competence again departed from the predicted pattern of higher intrinsic motivation for those in the mastery goal group.

5.4.2.3 Affect and intrinsic motivation summary

The findings for affect and intrinsic motivation in terms of performance and mastery groups were thus mostly similar according to both median split approaches. Both categorization approaches found that those whose persistence behavior reflected a mastery goal had greater positive affect, interest and enjoyment, and importance and effort ratings than those whose persistence behavior reflected a performance goal. These findings were in line with Hypothesis 2, but the group differences failed to reach significance. Unexpected findings across both categorization approaches were that those in the performance group had higher perceived competence and lower negative affect ratings than those in the mastery group, although the only difference in means to reach statistical significance was that of perceived competence in the time persistence analysis. These findings are discussed further in the discussion section of this Study (see Section 5.5), along with findings regarding the correspondence between persistence behavior and achievement goal methods.

5.4.3 Correspondence between persistence behavior and achievement goal methods

The performance and mastery groups according to both median split approaches were also used to explore Hypothesis 3: whether the mastery and performance persistence behavior of participants would correspond better with their subsequent Valence IAT scores than with their conscious, explicit self-reported AGQ-R (PAP, MAP, P_Avg, M_Avg). This prediction was made in line

with the potential dual process explanation offered in Study 1, that implicit methods might better predict spontaneous behavior, while explicit, self-report methods better predict subjective accounts.

5.4.3.1 Time persistence and achievement goal methods

To test Hypothesis 3, initially a count was made of the number of participants per persistence group who took each achievement goal method. The group sizes according to the time persistence median split were uneven, as is shown in Table 17. Descriptive statistics for each of the variables of interest by group are shown in Table 18.

Table 17. Participants by group and achievement goal method (time persistence median split)

Group	Achievement Goal Method		Total
	AGQ-R	Valence IAT	
Performance	8	17	25
Mastery	17	8	25
Total	25	25	50

Note. Group = membership based on median split according to average time spent on failure anagrams 1-3, AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Implicit Association Test.

Table 18. Achievement goal method means by group (time persistence median split)

Group	Variable of Interest	<i>n</i>	<i>Mean</i>	<i>Min.</i>	<i>Max.</i>	<i>SD</i>
Performance	PAP	8	3.88	2.00	5.00	0.85
	P_Avg	8	3.92	3.00	4.83	0.56
	MAP	8	4.21	2.67	4.67	0.67
	M_Avg	8	3.71	2.83	4.50	0.69
	IAT Score	17	-.0419	-.5376	.5816	0.2985
Mastery	PAP	17	3.39	1.67	5.00	1.06
	P_Avg	17	3.41	1.33	5.00	1.02
	MAP	17	4.39	3.00	5.00	0.54
	M_Avg	17	4.04	2.83	4.67	0.54
	IAT Score	8	-.0892	-.4310	-.3264	0.3131

Note. PAP = Performance Approach subscale score, P_Avg = mean of performance approach and avoidance subscales, MAP = Mastery Approach subscale score, M_Avg = mean of mastery approach and avoidance subscales, IAT = Implicit Association Test, *n* = number of participants per condition, *M* = mean, *Min.* = minimum, *Max.* = maximum, *SD* = standard deviation.

As shown in Table 18, those in the performance group had higher Performance Approach (PAP) and combined performance averages (P_Avg) than those in the mastery group. Similarly, those in the mastery group had higher Mastery

Approach (MAP) and combined mastery averages (M_Avg) than those in the performance group. In terms of Valence IAT scores, larger positive scores denote a performance preference, whereas more negative scores denote a mastery preference (cf. 5.4.1.2). Although the mean Valence IAT score for those in the mastery group was more negative than that of the performance group, the performance group mean Valence IAT score should have been positive for the Valence IAT to correspond with performance persistence. In sum, although group sizes were uneven (see Table 17), the AGQ-R subscales of interest were in line with the persistence groups, while the mean Valence IAT scores were not entirely consistent with persistence groups. This finding of correspondence analysis conducted at group level does not support Hypothesis 3, that the Valence IAT would be more consistent with persistence behavior.

To explore this correspondence at the level of the individual participant, an assessment was made of how many performance group participants had responded with a higher performance average on the AGQ-R or reacted more quickly to Performance Goals and Good on the Valence IAT. The same was done for participants categorized into the mastery group. The results of this analysis are shown in Table 19 below.

Table 19. Consistency of responses by group and achievement goal method (time persistence median split)

Group		AGQ-R	Valence IAT	Total
Performance	Consistent	6	7	13
	Inconsistent	2	10	12
	Total	8	17	25
Mastery	Consistent	10	4	14
	Inconsistent	7	4	11
	Total	17	8	25
Total	Consistent	16	11	27
	Inconsistent	9	14	23
	Total	25	25	50

Note. AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Implicit Association Test.

As shown in Table 19, for participants whose persistence (in terms of average time spent on anagrams 1-3) signified a performance goal, the combined achievement goal measures were consistent with this behavior for 13 out of 25

participants. In terms of participants whose persistence signified a mastery goal, the combined achievement goal measures were consistent with this behavior for 14 out of 25 participants. In total, the combined achievement goal methods were consistent with behavior across the sample for 27 participants out of a total sample size of 50. Out of these consistent instances, 11 participants had taken the Valence IAT, and 16 had taken the AGQ-R. In terms of a median split based on average time spent on anagrams 1-3, the achievement goal methods were consistent with persistence behavior for just over half the sample, with the AGQ-R slightly more consistent than the Valence IAT. This finding of correspondence analysis conducted at the individual level also does not support Hypothesis 3, that the Valence IAT would be more consistent with persistence behavior.

5.4.3.2 Attempts persistence and achievement goal methods

To test Hypothesis 3 according to attempts persistence, a count was made of the number of participants per group who took each achievement goal method. The number of participants per condition and achievement goal method was more balanced than for the time persistence analysis, and is shown in Table 20.

Descriptive statistics for each of the achievement goal methods by group are shown in Table 21.

Table 20. Participants by group and achievement goal method (attempts persistence median split)

Group	Achievement Goal Method		Total
	AGQ-R	Valence IAT	
Performance	14	12	26
Mastery	11	13	24
Total	25	25	50

Note. AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Implicit Association Test.

Table 21. Achievement goal method means by group (attempts persistence median split)

Group	Variable of Interest	<i>n</i>	<i>Mean</i>	<i>Min.</i>	<i>Max.</i>	<i>SD</i>
Performance	PAP	14	3.40	2.00	5.00	0.96
	P_Avg	14	3.50	1.83	4.83	0.81
	MAP	14	4.38	2.67	5.00	0.55
	M_Avg	14	3.96	2.83	4.50	0.63
	IAT Score	12	-.0517	-.5376	.5816	0.2984
Mastery	PAP	11	3.73	1.67	5.00	1.07
	P_Avg	11	3.67	1.33	5.00	1.09
	MAP	11	4.27	3.00	5.00	0.63
	M_Avg	11	3.89	2.83	4.67	0.58
	IAT Score	13	-.0620	-.5171	.3264	0.3088

Note. PAP = Performance Approach subscale score, P_Avg = mean of performance approach and avoidance subscales, MAP = Mastery Approach subscale score, M_Avg = mean of mastery approach and avoidance subscales, IAT = Implicit Association Test, *n* = number of participants per condition, *M* = mean, *Min.* = minimum, *Max.* = maximum, *SD* = standard deviation.

Although the number of participants in each performance or mastery behavior group was more evenly spread across the achievement goal methods than in the time persistence analysis (see table Table 20), Table 21 suggests that neither the AGQ-R subscale means nor the mean Valence IAT scores corresponded with persistence behavior. Those who had made more attempts, the mastery group, actually had *higher* Performance Approach (PAP) and combined performance averages (P_Avg) than those in the performance group. Similarly, those in the performance group actually had higher Mastery Approach (MAP) and combined mastery averages (M_Avg) than those in the mastery group. In terms of mean Valence IAT scores, the same pattern emerged as in the time persistence analysis: those whose persistence behavior denoted a mastery goal had more negative mean scores than those whose behavior denoted a performance goal. As before, the mean Valence IAT score for those in the performance group should have been positive for the Valence IAT to correspond with performance persistence. In sum, this lack of correspondence based on analysis conducted at group level does not support Hypothesis 3, that the Valence IAT would be more consistent with persistence behavior.

To explore this correspondence at the level of the individual participant, an assessment was made of how many performance group participants had responded with a higher performance average on the AGQ-R or reacted more

quickly to Performance Goals and Good on the Valence IAT. The same was done for participants categorized into the mastery group. The results of this analysis are shown in Table 22.

Table 22. Consistency of responses by group and achievement goal method (attempts persistence median split)

Group		AGQ-R	Valence IAT	Total
Performance	Consistent	5	4	9
	Inconsistent	9	8	17
	Total	14	12	26
Mastery	Consistent	4	6	10
	Inconsistent	7	7	14
	Total	11	13	24
Total	Consistent	9	10	19
	Inconsistent	16	15	31
	Total	25	25	50

Note. Group = membership based on median split according to average attempts made on failure anagrams 1-3, AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Implicit Association Test.

In terms of participants whose persistence (in terms of average attempts made on anagrams 1-3) signified a performance goal, the combined achievement goal measures were consistent with this behavior for 9 out of 26 participants. In terms of participants whose persistence signified a mastery goal, the combined achievement goal measures were consistent with this behavior for 10 out of 24 participants. In total, the combined achievement goal methods were consistent with behavior across the sample for 19 participants out of a total sample size of 50. Out of these consistent instances, 10 participants had taken the Valence IAT, and 9 had taken the AGQ-R. In terms of a median split based on average attempts made on anagrams 1-3, although the group sizes were more balanced than for the time persistence analysis (see Table 20), the achievement goal methods were consistent with persistence behavior for under half the sample (see Table 22), with the Valence IAT slightly more consistent than the AGQ-R. However, the Valence IAT was not significantly more consistent with the behavior than the AGQ-R for correspondence analysis conducted at the level of the individual, and therefore this finding does not support Hypothesis 3.

5.4.3.3 Summary of correspondence analyses

In terms of group level analysis, there was greater correspondence between the AGQ-R and persistence behavior in terms of the time persistence categorization than there was in terms of attempts persistence categorization. Throughout the group level analysis, there was correspondence between the Valence IAT mastery group persistence, but this correspondence was not apparent with performance group persistence.

In terms of correspondence at the level of the individual, across both median split analyses, the achievement goal methods were consistent with persistence behavior 46 out of 100 times. On 21 occasions, the Valence IAT was consistent with behavior, and on 25 occasions the AGQ-R was consistent with behavior. Overall, the achievement goal methods were consistent with achievement behavior less than half the time, and the AGQ-R was only slightly more consistent with achievement behavior than the Valence IAT (i.e., for 4 more participants), leading to a rejection of Hypothesis 3.

5.4.4 Further Correlational Analyses

A final exploration of correlations examined the relationships between participants' behavioral persistence, their responses or reactions to the achievement goal methods, and their self-reported affect and intrinsic motivation. These correlations are illustrated in Table 23.

Table 23. Correlations between average persistence, achievement goal methods, affect, and intrinsic motivation

Variables	2	3	4	5	6	7	8	9	10
1. Time Anagrams 1-3	.83**	-.18	-.02	.29	.05	.19	.14	-.16	.18
2. Attempts Anagrams 1-3	—	-.18	.01	.18	.01	.06	.07	-.12	.01
3. Valence IAT Score		—	<i>a</i>	<i>a</i>	.11	.17	-.24	.20	.10
4. Performance Average			—	.14	-.09	.38	-.04	-.11	.05
5. Mastery Average				—	.33	.28	.30	-.03	.56**
6. Positive Affect					—	.08	.49**	.38**	.46**
7. Negative Affect						—	-.16	-.07	.18
8. Interest and Enjoyment							—	.18	.36**
9. Perceived Competence								—	.09
10. Importance and Effort									—

Note. ** $p < .01$, *a* could not be computed as participants either took the Valence IAT or the AGQ-R, IAT = Implicit Association Test, AGQ-R = Achievement Goal Questionnaire-Revised.

Table 23 indicates that few significant relationships were observed. In terms of achievement goal methods, the only significant relationship observed was between a higher mastery average on the AGQ-R and ratings of importance and effort on the IMI. This may have occurred as a result of the content correspondence in terms of task focus in the mastery items on the AGQ-R and the importance and effort subscale of the IMI. However, according to this logic, there should also have been a statistically significant relationship between a lower mastery average and lower ratings on the importance and effort subscale of the IMI, but this did not emerge from the correlational analysis. The Valence IAT score failed to correlate significantly with any variable. Furthermore, neither achievement goal method correlated significantly with the persistence measures (Hypothesis 3).

A significant relationship was observed between time and attempt persistence, suggesting that those who spent more time on the failure anagrams also made more attempts during this time, but neither type of persistence was related to affect or intrinsic motivation self-reports (Hypothesis 2). Positive affect ratings were significantly related to all three intrinsic motivation subscales, suggesting a consistently positive affect and intrinsic motivation experience for some

participants. However, this positive experience did not extend significantly to a higher mastery average or the lower, more negative Valence IAT score that denotes a mastery preference.

The final significant relationship was between the interest and enjoyment and importance and effort subscales of the IMI. The lack of significant correlation between these IMI subscales and the perceived competence subscale is of interest due to the fact that those in the performance group had higher (but not significantly) perceived competence ratings than mastery behaving participants in both median split categorizations.

5.5 Discussion

The research question guiding this study asked *will an implicit or explicit achievement goal method be more consistent with a student's achievement behavior?*

Achievement behavior was operationalized in terms of persistence (time and attempts) on failure anagrams 1-3. Hypothesis 1 was that some participants would persist more than others, the former representing a mastery response to failure and the latter a performance response to failure. This was supported by the findings of this study in that differences across performance and mastery group means reached statistical significance across both median split approaches (time split: time persistence: $t(48) = -6.591, p < .001, d = -1.86$; attempts persistence: $t(48) = -4.524, p < .001, d = -1.28$; attempts split: time persistence $t(48) = -4.040, p < .001, d = -1.13$; attempts persistence: $t(48) = -6.239, p < .001, d = -1.76$).

Hypothesis 2 was that those whose persistence denoted a mastery goal would also report experience greater positive affect and intrinsic motivation than those whose persistence denoted a performance goal. The mastery goal group in both persistence categorizations indeed reported greater positive affect, interest and enjoyment, and effort and importance than those in the performance goal group. However, the means comparisons did not find significant differences across groups for these variables, and the correlational analysis also failed to find a significant relationship between greater persistence (time and attempts) and any of the affect or intrinsic motivation subscales. As such, the study findings do not support Hypothesis 2.

However, a finding of interest regarding affect and intrinsic motivation was that for both categorization approaches, those in the performance goal group reported higher perceived competence and lower negative affect than those in the mastery goal group. Though there was only a significant difference for perceived competence in the time persistence median split analysis ($t(48) = 2.007, p = .05$), this finding is opposite to what was predicted according to theorized patterns for performance participants in repeated failure situations (Hypothesis 2). It may have been that those who persisted less in a way protected themselves from the negative experience of repeated failure. Indeed, by persisting less, they might have been able to retain a higher level of perceived competence and less negative affect than those in the mastery group, who were exposed to failure for longer by persisting more. However, this explanation would suggest that lower persistence should be related to higher perceived competence and lower negative affect, but both correlations failed to reach statistical significance.

The study also failed to find statistically significant support for Hypothesis 3, that the Valence IAT would correspond better with persistence behavior on an achievement task than the AGQ-R. At the group level, the analysis based on time persistence categorization showed correspondence between persistence behavior and the AGQ-R, while the attempts persistence categorization did not. At the group level, both persistence categorizations showed correspondence between persistence behavior and the Valence IAT score only for those in the mastery goal group. At the individual level, the analysis based on time persistence categorization showed correspondence between the persistence behavior and achievement goal method for 27 participants (16 AGQ-R, 11 Valence IAT), out of the total sample size of 50. At the individual level, the analysis based on attempts persistence showed correspondence between persistence behavior and achievement goal method for 19 participants (9 AGQ-R, 10 Valence IAT), out of the total sample size of 50. Across both categorization approaches, with a total sample size of 100, correspondence was thus only observed less than half of the time (46%), and the AGQ-R corresponded with persistence behavior on only four more occasions than the Valence IAT. Consequently, responses and reactions to the two achievement goal methods

seemed to be equally consistent with behavior. However, given that both achievement goal methods corresponded less than half the time, neither method performed particularly well.

Two potential explanations offered for this poor performance are that there was a problem with the study design such as the operationalization of achievement goal behavior, or that these methods are actually not very consistent with achievement goal behavior. The finding that the time and attempts persistence failed to correlate significantly with any of the other variables is suggestive of the former explanation: that there was a problem with the operationalization of achievement goal behavior. On one hand, this lack of correlation could have resulted from the lack of content correspondence between the persistence indicators and the other methods. On the other hand, it is ceded that there was a struggle to discern an achievement task that met the requirements of being dichotomous in order to be compared with the Valence IAT, and of differentiating between achievement goals, given some more positive findings for performance approach goals in comparison to performance avoidance goal as a result of exploration of the 2 x 2 model (Elliot & McGregor, 2001).

Future studies might thus explore alternatives such as measuring persistence differently (Bouffard, Boisvert, Vezeau, & Larouche, 1995; Elliot, McGregor, & Gable, 1999; Pintrich et al., 1993), or focusing on different paradigms such as effort (Elliot et al., 1999), deep and surface learning strategies (Elliot et al., 1999; Entwistle, 1988), help-seeking (Ryan & Pintrich, 1997) or academic self-handicapping (Midgley & Urdan, 2001). In addition to this, while examining persistence behavior, affect and intrinsic motivation may represent a valid approach for differentiating between dichotomous performance and mastery goals, perhaps the assignment of participants to performance and mastery goal groups based on a median split may have played a role in the lack of overall correspondence between persistence behavior and achievement goal methods. However, this median split approach is only one of what are likely to be several ways of allocating participants to mastery and performance persistence groups, and as such, other analyses might better help uncover what is going on.

The second potential explanation was that these methods are actually not very consistent with achievement goal behavior. Given that the Valence IAT is a new method, continued investigation will need to contribute towards assessing its predictive validity. However, the AGQ-R is a well-established tool. If it fails to significantly reflect students' achievement behavior, this is a problem for achievement goal research, and researchers must question what they have been measuring. Of course, one study with equivocal findings is not enough to undermine findings based on the AGQ-R. As such, more studies exploring the links between the AGQ-R and students' behavior are necessary to assess the potential implications of the claim made in Chapter 3, that achievement goal questionnaires may only capture *post hoc* rationalizations of general achievement behavior rather than illuminate achievement goals.

5.6 Conclusion

This study tried to explore whether implicit or explicit methods correspond better with achievement goal behavior. Participants were administered an induced failure anagrams task, and then reported on their affect and intrinsic motivation, before completing either the Valence IAT or the Achievement Goal Questionnaire-*Revised*. While some participants indeed persisted more than others, the study failed to reveal theoretically predicted links between persistence on the achievement task and affect and intrinsic motivation. Moreover, the Valence IAT and the AGQ-R were equally consistent with the persistence behavior, but were only consistent less than half the time. Given that a potential reason for these equivocal results may lie in the median split categorization of participants into mastery and performance goal groups, in Study 3, an attempt is made to manipulate the categorization of persistence behavior. This manipulation is done using a priming procedure as Study 3 explores the potential for nonconscious achievement goals and their influence on achievement behavior.

6 Study 3 Priming achievement goals? Successful nonconscious activation of achievement goals – behavioral evidence of nonconscious operation of achievement goals?

Introduction

As with the previous two chapters, this chapter reports on an empirical study, conducted in alignment with aim 3b, to *assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through designing and running a series of studies to empirically test if achievement goals can operate and be captured without conscious awareness*. More specifically, this chapter addresses sub-aim 3b(iii): *exploring if achievement goals can be nonconsciously activated (primed) and subsequently influence achievement behavior*. In other words, this study asks, is it possible to prime an achievement goal such that it is reflected in achievement behavior? To answer this question, the chapter reports on a study that attempted to nonconsciously activate performance and mastery achievement goals, and then compared the persistence behavior of both primed and non-primed participants to assess whether the priming had been successful, and whether it is thus possible to prime achievement goals.

The chapter starts off by providing the background to the study, before describing the procedure and results. 72 participants were randomly allocated to a performance, mastery, or no goal (control) condition. Following a supraliminal priming procedure, all participants completed the same anagrams task as described in the previous study, and as before, were asked to reflect on this task in self-report affect and intrinsic motivation questionnaires. The findings from Study 3 set the scene for the final study of this thesis (Study 4), which explores the relationship between the nonconscious activation of achievement goals and participants' subsequent responses to implicit and explicit achievement goal methods.

6.1 Background

One way of exploring nonconscious achievement goals is to attempt to access them and compare these findings with those of self-report methods; another way is to explore whether nonconscious achievement goals can be activated to influence participants' goal-driven achievement behavior. While there have been many attempts at priming nonconscious goals in general, such as the four seminal studies by Bargh, Gollwitzer, Lee-Chai, Barndollar and Trötschel (2001), there have been very few attempts at priming nonconscious *achievement goals*. If some evidence could show that this was possible, it would begin to shed light on the possibility that achievement goals, as cognitive representations, can operate both consciously and nonconsciously, with implications for how they are theorized and accessed.

There are of course recent studies that explore nonconscious activation and achievement goals. In recent priming studies involving achievement goals, for example, Elliot and colleagues (2007) explored the effects of priming the color red on achievement goals. However, by doing so, it was the color red rather than achievement goals that was primed. Similarly, in Ciani and Sheldon's (2010) study of the letters A and F and achievement goals, again, the letters were primed, not the achievement goals. Recently, a study by Engeser (2009) purported to explore if word class and the explicit achievement motive moderate the nonconscious activation of achievement goals. Although finding "small but consistent effects of the nonconscious activation of the achievement goal" (p. 2), in actuality, Engeser's study only looked at the goal *to achieve* rather than achievement goals according to Nicholls (1984), Dweck (1986) and colleagues. Hence, none of these studies have actually attempted to prime *achievement goals* in order to explore if they can be nonconsciously activated and impact on achievement behavior without the conscious awareness of the individual. The only studies that have somewhat attempted to do this are a series of experiments on projection effects by Kawada, Oettingen, Gollwitzer, and Bargh (2004).³⁷

³⁷ This was the only series of studies that attempted to prime *achievement goals* rather than the goal *to achieve* that could be found at time of writing (2015). More recent studies claiming to

Kawada and colleagues (2004) were interested in whether individuals project nonconsciously activated goals. As such, in their first experiment, the researchers investigated whether presenting participants who espoused an entity or incremental theory of intelligence (Dweck, 1999) with an achievement scenario would activate a performance or learning goal, respectively, and subsequently lead participants to describe a fictional character as possessing this goal. For example, they predicted that presenting an entity theorist with an achievement scenario would nonconsciously activate a performance goal and lead them to project this goal onto the fictional character in that scenario. Although the findings supported the researchers' hypothesis in that there were significant differences between the incremental and entity theorists' projection of learning and mastery goals, Kawada and colleagues were not satisfied that the findings showed "for sure whether the learning and performance goal orientations did indeed become activated by simply presenting participants holding either incremental or entity theories with achievement scenarios" (2004, p. 548). Hence, they conducted a second study, replacing the achievement scenarios with a supraliminal priming task.

In this second study, Kawada and colleagues (2004) compared implicit and explicit goal projection. The researchers began by either explicitly assigning or using a supraliminal priming task to activate the goal *to compete*. The researchers then asked primed and control group participants to evaluate the competitiveness or cooperativeness of fictional characters in a prisoner's dilemma game. Kawada and colleagues predicted that those primed with the goal *to compete* would be significantly more likely to judge the fictional characters in the game as competitive, thereby demonstrating the projection of their nonconsciously activated goal. However, although this second study was meant to increase the researchers' confidence in their previous finding by assuring that they had "indeed created implicit goal orientations" (Kawada et al., 2004, p. 549), the achievement goals that they had attempted to activate in Study 1 were now replaced in Study 2 by the goal *to compete* rather than a

assess the effects of nonconscious achievement goals on performance and other variables of interest also use the latter rather than the former definition when considering achievement goals (e.g., Greenlees, Figgins, & Kearney, 2014; Seitchik & Harkins, 2014).

learning or performance goal. Consequently, there has not yet been an adequate exploration of nonconsciously activated *achievement goals*.

The primary aim for Study 3 was thus to assess whether achievement goals can be nonconsciously activated. As mentioned in the introduction, the overarching question guiding this research was: *Are the implications of research on implicit cognition applicable to achievement goal theory?* This question is tested explicitly here, in that research on implicit cognition has shown that goals can be nonconsciously activated, and this empirical investigation looks at whether this applies to achievement goals. Accordingly, the research question for this study was: *is it possible to prime an achievement goal such that it is reflected in achievement behavior?*

6.1.1 Selection of an achievement goal priming procedure

In a typical priming paradigm, “the concept under study is first primed by causing the participant to think about or use it in some way that is unrelated to the focal task that comes next in the experiment” (Gollwitzer & Bargh, 2005, p. 627). As such, the priming task selected for this study was one that would be unrelated to the anagram persistence task, which represented the dependent variable. Given that Kawada and colleagues (experiment 1, 2004) were not satisfied that using an achievement scenario to prime achievement goals had definitely activated participants’ achievement goals, and had therefore used a Scrambled Sentence Test in their next study, the decision was made to use a Scrambled Sentence Test as the priming task in the current study.

The Scrambled Sentence Test is a commonly employed method of supraliminal priming in automaticity research (Bargh & Chartrand, 2000), and originated in the work of Srull and Wyer (1979). As the task is presented as a test of language ability, the primes are in plain view, rather than subliminally presented, and comprise words synonymous with the single construct the researchers are trying to activate. By using synonyms, the underlying construct is repeatedly activated, comprising the priming manipulation.

The instructions for a Scrambled Sentences Test ask participants to unscramble 25 jumbled sentences, using four out of five of the available words in order to create coherent, complete sentences. For example, provided with the five words *up, time, wake, to, and gold*, a participant could construct the four-word sentence *time to wake up*. In a typical study, participants in the experimental group are presented with different synonyms of the construct to be primed in ten of the scrambled sentences, while the remaining fifteen sentences contain only neutral words. Those in the comparison group are only presented with neutral words (i.e., all 25 sentences are neutral). So, for example, in a priming study by Bargh, Chen, and Burrows (experiment 1, 1996), the researchers were interested in priming the trait constructs of politeness and rudeness, in comparison to a neutral condition, to see whether these impacted on participants' likelihood and frequency of interrupting a conversation. Those in the politeness condition were presented with words such as *polite, respect* and *considerate*, while those in the rudeness condition were presented with words such as *impolite, rude, and obnoxious*, and participants in the neutral condition had entirely unrelated words.

Adapting the Scrambled Sentence Test to prime achievement goals involved creating three conditions: one for performance goals, one for mastery goals, and one neutral, no achievement goal condition (i.e., only using non-achievement-related words). Drawing from the normative comparison, competence-based words used by Kawada and colleagues (experiment 2, Kawada et al., 2004), the sentences presented to the experimental group in the performance goal condition contained 10 performance approach goal scrambled sentences, with words related to the normative comparison criteria of performance goals, such as *win, compete, overtake, better, and best*, and were interspersed with 15 neutral sentences. Words focusing on the development of competence against an intrapersonal or absolute task standard were used for the mastery goal experimental condition. Hence, on the mastery version of the Scrambled Sentence Test, there were 10 mastery goal scrambled sentences, containing words such as *understand, learn, improve, progress, and persist*, alongside 15 neutral sentences. The Scrambled Sentence Test for the control group featured 25 neutral sentences, neutral in that they made no reference to

achievement-related terms or ideas, and should therefore fail to result in any achievement-related priming. Complete versions of the priming tasks for each condition can be found in the appendix (see Appendices 10.3.1, 10.3.2, and 10.3.3).

Engeser (2009) has recently suggested that a potentially key difference between neutral condition and achievement priming conditions is the use of the verbs in the latter conditions. Engeser theorized that using verbs may be linked to greater activation power than the nouns that are sometimes used in the neutral conditions. Engeser's (2009) analysis ultimately did not find an effect of word type on the effectiveness of activating nonconscious achievement-related goals. However, in the current study, as the words chosen for the performance and mastery goal priming conditions were verbs, it was decided that the words used in the scrambled sentence for the neutral condition would also be verbs.

6.2 Hypotheses

The overall hypothesis for Study 3 was that achievement goals could be nonconsciously activated to influence subsequent behavior on an achievement task. This prediction was based on the wealth of priming studies that have suggested the successful activation, fulfilment, and accompanying affect of processing and behavioral goals (e.g., Chartrand & Bargh, 1996; Bargh et al., 2001; see also Section 3.2.4). Furthermore, this prediction was based on the posited model of achievement goals as cognitive representations that can equally be activated by conscious control as by environmental features (see Section 3.3).

In order to determine whether the nonconscious activation of achievement goals had been successful, a series of more directly testable hypotheses were produced. Firstly, different achievement goal primes would need to lead to different achievement goal-led behavior, and possibly even affect and intrinsic motivation. Given that this study employed the same anagram achievement task as the previous study (see Section 6.3 below), the first hypothesis for the study was that those who were primed with a nonconscious mastery goal would persist longer both in terms of time spent and attempts made on the anagrams

task than those in the performance goal prime and the no prime conditions. No predictions were made about the persistence behavior of those primed with a performance goal in comparison with those in the no prime condition.

It was predicted that those who were primed with mastery goals would report greater positive affect, lower negative affect, and higher intrinsic motivation than those in the performance goal prime condition. Given that the performance prime would be activating an achievement goal and that the situation was characterized by failure, it was predicted that this would negatively impact performance-primed participants' affect and intrinsic motivation more than it would impact those in the no prime group. Indeed, in a series of studies Chartrand and Bargh (Chartrand, 1999; Chartrand & Bargh, 2002) found that task difficulty was linked to mood for those primed with the goal to achieve, and not for those who had not been primed. Hence, those who had a nonconsciously activated goal to achieve were either in a better mood after an easy task or in a worse mood after a difficult task without knowing why, resulting in the term “mystery moods” (Chartrand, 1999; Chartrand & Bargh, 2002).

In summary, the hypotheses for Study 3 were that:

1. *Those primed with a mastery goal will persist longer than those in the performance goal and neutral conditions*
2. *Those primed with a mastery goal will report the highest positive affect, followed by the neutral and then performance goal conditions*
3. *Those in the neutral condition will report the lowest negative affect, followed by the mastery goal and then performance goal conditions*
4. *Those primed with a mastery goal will report the highest intrinsic motivation, followed by the neutral and then performance goal conditions*

6.3 Method

6.3.1 Participants

Participants were 72 students enrolled in different faculties at a university in the northeast of England. There were 36 female and 36 male students in the sample. 36 participants were undergraduates (years 1-4), and the remaining 36

were postgraduates (Masters and PhD students). All participants were contacted personally by the researcher and asked if they would like to volunteer their participation.

6.3.2 Materials

6.3.2.1 Priming Task

The priming task used was the Scrambled Sentence Test, as described in Section 6.1.1.

6.3.2.2 Achievement Behavior Task

In a typical priming study, the next task is presented as ostensibly unrelated. For this study, the task needed to elicit achievement behavior and also distinguish between performance and mastery goals. Hence, drawing on Sideridis and Kaplan (2011), as well as other achievement studies using anagrams (Ciani & Sheldon, 2010; Elliot et al., 2007), the anagrams task from the previous study was used again.

As before, this task was used to induce a failure experience that could distinguish between performance and mastery responses. Also as before, anagrams were chosen from a list of difficult anagrams (Remedios, 2000), and an extra letter was added to make them unsolvable. Presentation of anagrams was identical to the procedure followed in the previous study (see Section 5.3.2.1). The five anagrams used in this study are displayed in Table 24.

Table 24. Anagrams

No.	Type	Original Anagram	Original Solution	Added Letter	Anagram w/ added letter
1	Unsolvable	EEGBCRI	ICEBERG	K	EKEGBCRI
2	Unsolvable	ACTIONAR	RAINCOAT	F	ACTIONARF
3	Unsolvable	CAMMSIEHN	MECHANISM	D	CAMMDSIEHN
4	Solvable	ICDHL	CHILD	-	-
5	Unsolvable	YRBEREW	BREWERY	U	UYRBEREW

6.3.2.3 Affect and Intrinsic Motivation

As in Study 2, further information about the participants' experience of the achievement task was elicited using the brief 20-item Positive and Negative

Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988). The subscales consisted of Positive Affect (10 items; $\alpha = .85$) and Negative Affect (10 items; $\alpha = .83$).

Participants' experience of the achievement task was also assessed using their responses to the Interest and Enjoyment ('I enjoyed doing this activity very much', 7 items; $\alpha = .90$), Perceived Competence ('I think I am pretty good at this activity', 6 items; $\alpha = .73$), and Effort and Importance ('It was important to me to do well at this task', 5 items; $\alpha = .81$) subscales of the Intrinsic Motivation Inventory (IMI, Ryan, 1982).

6.3.3 Procedure

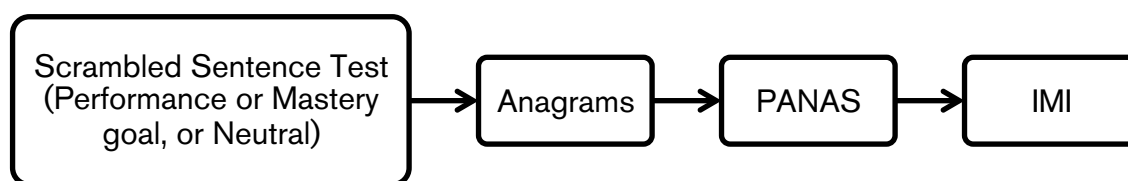


Figure 14. Study 3 methods

An overview of the procedure is illustrated in *Figure 14*. All participants were run individually in a room free from noise and distractions. On arrival to the room, participants were invited to sit at a desk with the consent form (see Appendix 10.3.4) and an envelope on it. Once they had completed the consent form, they were instructed to pick any one piece of folded paper randomly from the envelope and complete it. The envelope contained the Scrambled Sentence Tests for all three conditions (performance, mastery, and neutral). Once participants had finished the Scrambled Sentence Test, they were instructed to fold it and put it to the side. This process ensured that the researcher was blind to the participants' condition.

Next, participants were administered the anagrams task, following the same procedure as in the previous experiment. As such, each anagram was written inside a folded slip of paper, and numbered on the outside with its number (i.e.,

1-5). Scrap paper and a pen were provided. Again, participants were instructed that they must answer the anagrams in numerical order, that they could only have one slip open at a time, and that once they had moved on from one slip, they could not return to it. Participants were told that they could spend as long as they wished on the anagrams and that once they had completed the anagram, they should write the solution on an answer sheet. If they wanted to move on from one that they had been unsuccessful in solving, they could just draw a dash next to the number. While the participants worked on this task, the researcher surreptitiously noted the start and end times for each anagram, measured from the time the participant opened the folded slip until they closed it and put it aside. Verbalizations were also informally recorded in the form of notes taken by the researcher while the participant worked on the task.

Once the participants indicated that they were ready to move on from the anagrams task, the researcher collected any scrap paper they had used for their attempts, and handed them the PANAS and the IMI. They were asked to do the PANAS first and then the IMI. Participants were instructed to keep the anagrams task in mind while filling out both questionnaires.

When these were complete, the researcher engaged each participant in funnelled debriefing (Bargh & Chartrand, 2000, p. 285) to determine whether they had become aware of any patterns in the Scrambled Sentence Test, and any relations between the Scrambled Sentence Test and the anagrams task. More specifically, the funnelled debriefing method tried to ascertain what the participants thought the aim of the experiment was, if they were suspicious about any aspects of it, whether they thought the tasks were related, and whether they noted any theme recurring throughout the study (see Appendix 10.3.5 for questions).

When the funnelled questioning was complete, the researcher debriefed each participant in full.³⁸ As with Study 2, in accordance with suggestions made during the ethics review, given the limited information provided during recruitment, the use of a cover story for the priming task, the nonconscious

³⁸ Again, for those who had to leave directly after finishing, the researcher sent a full debrief by email.

activation, and the covert measurement of persistence behavior, the researcher explained why this had been necessary (i.e., to avoid influencing participant persistence behavior). The researcher also explained that all but one of the anagrams was unsolvable, and that even the solvable one came from a list of difficult anagrams, so no participant would leave the room feeling disappointed in their performance. The researcher presented participants with the opportunity to access their time per anagram and any notes that the researcher had covertly made on their verbalizations during the task, and answered any remaining questions participants had. Finally, participants were thanked and dismissed.

6.4 Results

On the basis of having to pick out a Scrambled Sentence Test from the envelope at the beginning of the experiment, all participants were allocated to one of three priming conditions (performance, mastery, and control), with a total of 24 participants in each group. The funnelled debriefing procedure suggested that none of the participants were suspicious about the influence of the Scrambled Sentence Test on their performance on the anagrams task. The research question for this study asks, *is it possible to prime an achievement goal such that achievement behavior reflects the primed goal?* The following sections cover the analysis of whether the primes impacted on persistence behavior, affect, and intrinsic motivation.

6.4.1 Priming and Persistence

In order to determine if the priming had been successful, the analysis began by examining the achievement behavior. As in Study 2, the achievement behavior was characterized by persistence on the anagrams task, both in terms of the time spent on each anagram and attempts made. Time spent on each anagram was computed from the times that each participant opened and closed each anagram. One participant did not follow the instructions of closing the anagram when putting it to the side, so their time per anagram could not be calculated, and they were excluded from persistence calculations in terms of time spent on anagrams. In terms of total time spent on all five anagrams, participants ranged

from spending around 4 minutes to approximately 70 minutes, with a mean time of about 26 minutes.

As in Study 2, the attempts made on each anagram were derived from the scrap paper on which participants did their working out. An attempt represented the number of times a series of anagram letters was written anew. In terms of total attempts made across the five anagrams, participants ranged from making one attempt to 133, with a mean of 48. Out of the 72 participants, 63 got the fourth anagram (CHILD) correct, representing almost 88% of the sample. Of the nine who failed to solve this anagram, five participants had been primed with performance, while two had been primed with mastery, and two had not been primed with a goal.

Also as in Study 2 (see Section 5.4.1.3), persistence averages were calculated on the basis of anagrams 1-3 because these anagrams were unsolvable and thus allowed for the examination of participants' responses to a failure situation. Table 25 shows the means and standard deviation for time spent and attempts made on anagrams 1-3 across performance, mastery, and neutral prime conditions, while *Figure 15* and *Figure 16* illustrate the difference in means across priming conditions.

Table 25. Means and standard deviations of average amount of time and attempts on anagrams 1-3 by priming condition

Priming Condition	<i>n</i>	Mean Time on Anagrams 1-3		<i>n</i>	Mean Attempts on Anagrams 1-3	
		<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>
Performance	24	329	212	24	8.29	6.55
Mastery	23 ^a	464	245	24	14.57	9.53
Neutral	24	429	232	24	11.82	7.39
Total	71	406	233	72	11.56	8.23

Note. ^a Time per anagram could not be computed for one mastery goal-primed participant, Mean Time on Anagrams 1-3 is reported in seconds, *n* = number of participants per condition, *M* = mean, *SD* = standard deviation.

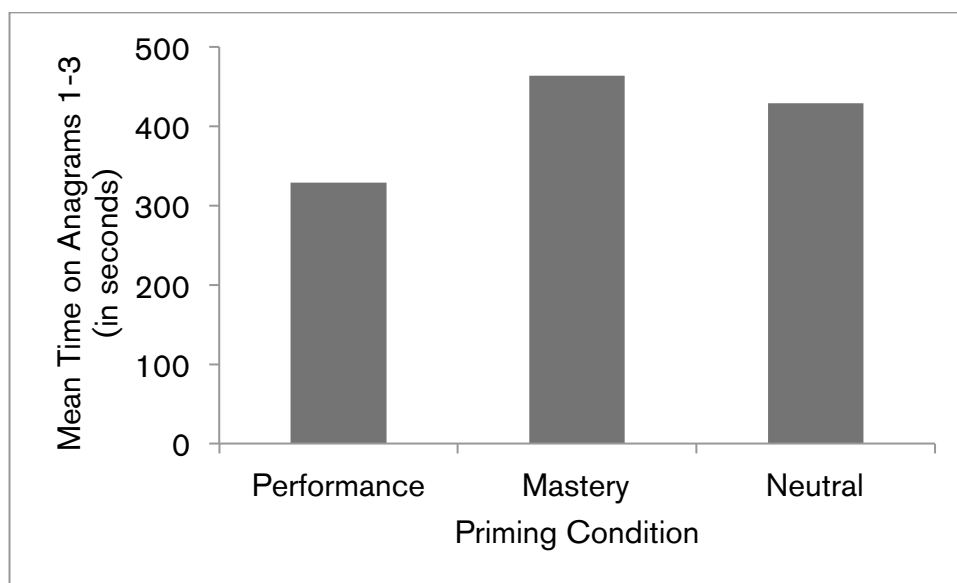


Figure 15. Mean time spent on anagrams 1-3 by priming condition

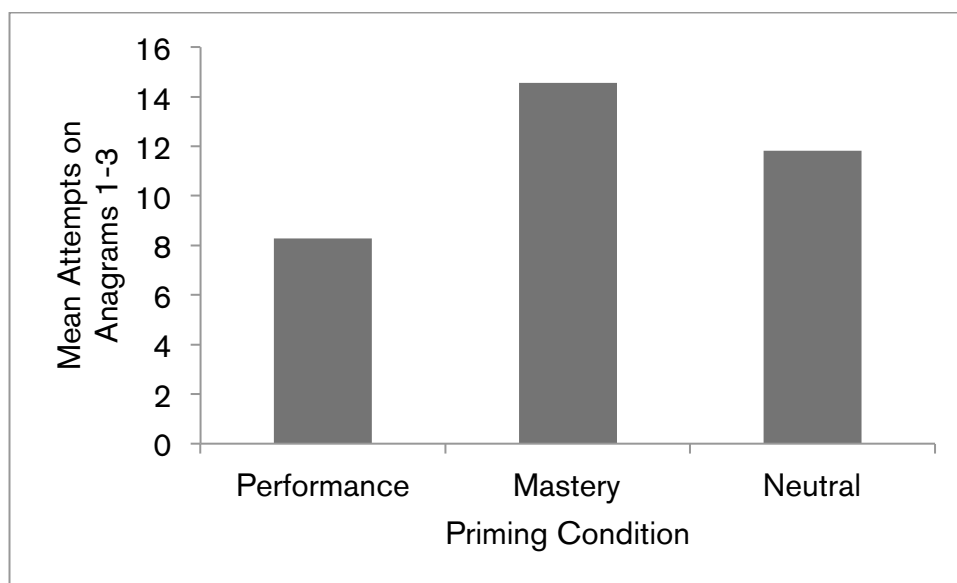


Figure 16. Mean attempts made on anagrams 1-3 by priming condition

As predicted (Hypothesis 1), on average, participants primed with a mastery goal spent longer and made more attempts than those in the performance and neutral prime conditions. There had not been a specific prediction for how performance goal-primed and neutral group would compare in terms of persistence, but as shown in Table 25, performance goal-primed participants spent even less time and made fewer attempts on anagrams 1-3 than those who had not been primed with a goal at all.

A one-way ANOVA was then conducted to test if there were differences in means across two dependent measures. The findings revealed a statistically significant difference between groups for persistence in terms of mean *attempts* on anagrams 1-3, $F(2,69) = 3.79, p = .028, \eta_p^2 = 0.10$, but not for mean *time spent* on anagrams 1-3, $F(2,68) = 2.18, p = .12, \eta_p^2 = 0.06$ (see Table 25, Figure 15, and Figure 16). A *post hoc* Tukey test revealed that the mean attempts on anagrams 1-3 was statistically significantly lower at $p < .05$ for those in the performance goal prime group compared to those in the mastery goal prime group. There were no statistically significant differences in mean attempts on anagrams 1-3 between the neutral group and the two goal priming conditions ($p = .28$).

Further exploration using the independent samples t-test procedure showed the differences between the performance and mastery goal primed conditions to be at significance for both time spent (performance $M = 329$ seconds, mastery $M = 464$ seconds, $t(45) = 2.015, p = .05, d = -0.59$) and attempts (performance $M = 8.29$, mastery $M = 14.57, t(46) = 2.659, p = .01, d = -0.77$). Comparisons of persistence in terms of both time spent and attempts made between the neutral condition and each of the goal prime conditions were non-significant (time: performance and neutral $p = .13$, mastery and neutral $p = .62$; attempts: performance and neutral $p = .09$, mastery and neutral $p = .27$). Hence, there was a greater difference in for both types of persistence between performance and mastery goal conditions, but no statistically significant differences between the control group and either of the experimental conditions. This suggests the trend for differences by condition in persistence behavior on the anagrams task was moving in the right direction, and partially supports Hypothesis 2.

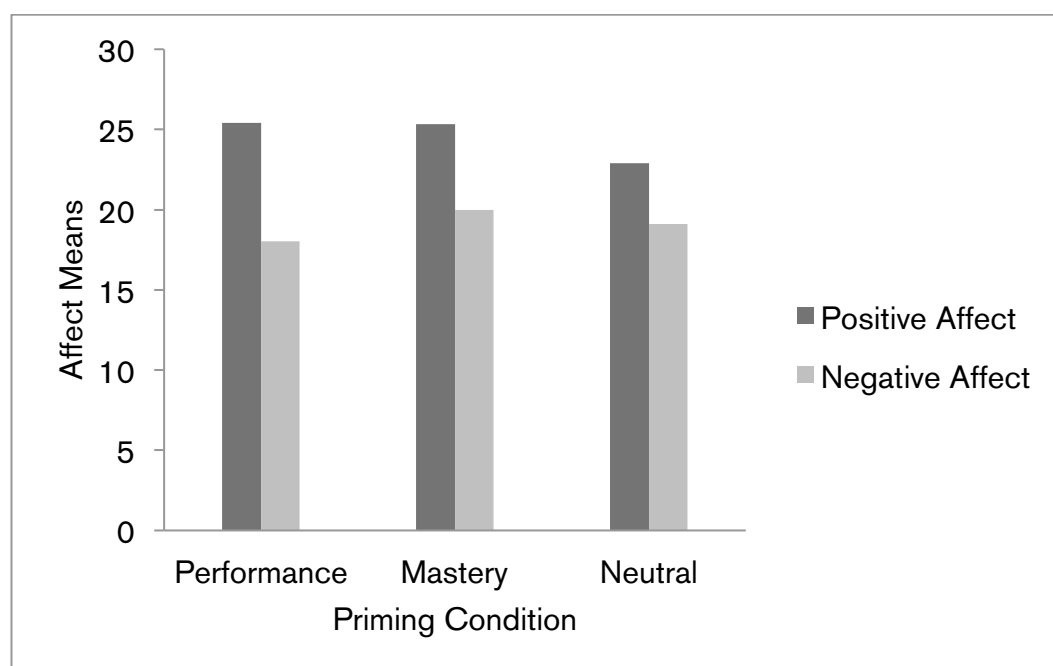
6.4.2 Priming and Affect

In order to determine if the priming had been successful, the analysis also examined group differences in reported affect. The ratings for all positive and all negative affect were summed to create separate positive and negative affect subscale scores ranging between 10 (answering 1 for each item) and 50 (answering 5 for each item). Table 26 lists, while Figure 17 visualizes, the average positive and negative affect scores across conditions.

Table 26. Means and standard deviations of positive and negative affect by priming condition

Priming Condition	<i>n</i>	Positive Affect		Negative Affect	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance	24	25.42	7.04	18.04	6.12
Mastery	24	25.33	6.68	20.00	6.69
Neutral	24	22.92	5.45	19.12	6.73
Total	72	24.56	6.44	19.06	6.47

Note. *n* = number of participants per condition, *M* = mean, *SD* = standard deviation.

**Figure 17. Positive and Negative affect means by priming condition**

As shown in Table 26, the findings regarding positive and negative affect across priming conditions did not support either Hypothesis 2 or Hypothesis 3. Instead of the expected pattern of mastery, then neutral, then performance group for highest positive affect, those in the performance goal-primed condition reported slightly higher positive affect than those in the mastery goal-primed condition, followed by those in the neutral condition. This finding potentially suggests that having a goal seemed to be related with greater positive affect than not having a goal on the failure inducing achievement task. Next, instead of performance, then mastery, and then neutral group as expected for highest negative affect, those in the mastery goal-primed condition had the highest negative affect, followed by the neutral and then only the performance goal-primed condition.

A one-way ANOVA was conducted to assess if there were differences in means across the two dependent measures. The group differences listed in Table 26 failed to emerge as statistically significant for both positive affect ($F(2,69) = 1.172, p = .316, \eta_p^2 = 0.03$) and negative affect ($F(2,69) = .544, p = .583, \eta_p^2 = 0.02$). The findings of independent samples t-tests also failed to find any significant differences across the priming conditions (all p 's $> .18$).

6.4.3 Priming and Intrinsic Motivation

In order to determine if the priming had been successful, the analysis also considered group differences in reported intrinsic motivation. The ratings for each of the IMI subscales were averaged, giving three subscale scores (interest/enjoyment, perceived competence, and importance/effort). Next, the means across the priming conditions were compared, as listed in Table 27 and visualized in *Figure 18* below.

Table 27. Means and standard deviations of intrinsic motivation subscales by priming condition

Priming Condition	Interest/Enjoyment		Perceived Competence		Importance/Effort	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Performance	4.16	1.26	2.17	0.95	4.87	1.07
Mastery	4.24	1.15	1.78	0.62	5.08	1.20
Neutral	3.69	1.04	1.87	0.65	4.65	0.82
Total	4.03	1.16	1.94	0.76	4.86	1.04

Note. *M* = mean, *SD* = standard deviation.

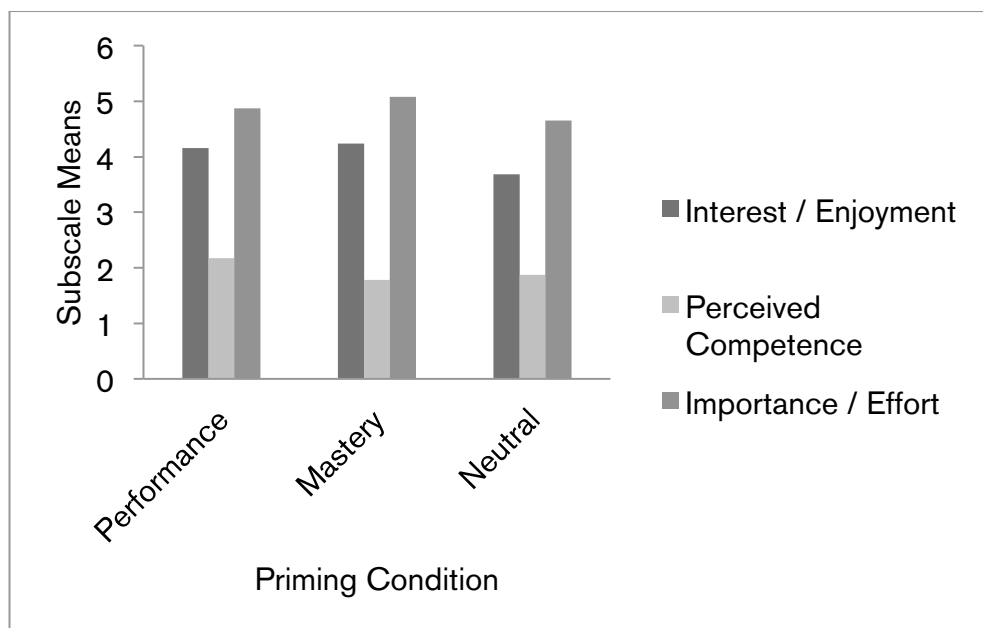


Figure 18. Intrinsic motivation means by priming condition

Hypothesis 4 predicted that failure would not undermine the intrinsic motivation of the mastery goal-primed participants as badly as it would affect those in the performance goal-primed condition, and this hypothesis was supported in the interest and enjoyment findings. Although it had been predicted that by having a goal and not being able to fulfil it, the participants in the performance goal-primed condition would have lower intrinsic motivation generally than those in the neutral condition, the inverse emerged in the interest and enjoyment findings.

In terms of perceived competence, there were no explicit predictions, as all participants were expected to have low ratings due to the induced failure of the anagrams task. Ultimately, the findings shown in Table 27 revealed that despite having failed on the same amount of anagrams, there were differences in the group means. Participants in the performance goal priming condition had the highest perceived competence ratings, followed by those in the neutral condition, and then those in the mastery goal priming condition. This is an interesting finding given that it mirrors, albeit in the inverse, the pattern of persistence on the anagrams task (i.e., performance goal-primed participants spent the least time and made the fewest attempts on average, followed by the neutral group, and then the mastery goal-primed participants), suggesting that

perhaps the more a participant persisted, the worse (and more realistic) their perceived competence.

In terms of importance and effort, it was predicted that those in the mastery goal-primed condition would have the highest ratings, followed by those in the neutral condition, and then those in the performance goal priming condition. The findings shown in Table 27 indeed reflected mastery goal-primed participants' high mean ratings, in line with the finding that they had persisted for longer and made more attempts than those in the other two conditions. Interestingly, despite persisting less than those in the neutral group, performance goal-primed participants reported higher mean importance and effort.

The differences across the group means for all three subscales and priming conditions were small, so when subjected to a one-way ANOVA, none emerged as statistically significant (interest/enjoyment $F(2,69) = 1.607, p = .208, \eta_p^2 = 0.05$; perceived competence $F(2,69) = 1.770, p = .178, \eta_p^2 = 0.05$; importance/effort $F(2,69) = 1.001, p = .373, \eta_p^2 = 0.03$). The findings of independent samples t-tests also failed to find any significant differences across the priming conditions (all p 's $> .08$).

6.4.4 Further Correlational Analyses

A *post hoc* correlational analysis was conducted to further examine the relationships between participants' behavioral persistence and their self-reported affect and intrinsic motivation. As such, there were no hypotheses. The correlations are illustrated in Table 28.

Table 28. Correlations between average persistence, affect, and intrinsic motivation

Variables	2	3	4	5	6	7
1. Time Anagrams 1-3	.81**	.14	.08	.16	-.05	.35**
2. Attempts Anagrams 1-3	—	.10	.11	.12	-.10	.37**
3. Positive Affect		—	-.03	.70**	.42**	.43**
4. Negative Affect			—	-.15	-.24*	.10
5. Interest and Enjoyment				—	.36**	.41**
6. Perceived Competence					—	.11
7. Importance and Effort						—

Note. * $p < .05$ level, ** $p < .01$ level.

As shown in Table 28, there were several statistically significant correlations. For example, the two behavioral indicators of persistence, average time and attempts, were highly related ($r = .81, p < .01$). There was also a positive relationship between average time spent and attempts made on anagrams 1-3 and importance and effort ratings on the IMI (time spent: $r = .35, p < .01$; attempts made: $r = .37, p < .01$). A positive relationship was also observed between the positive affect subscale of the PANAS and higher ratings on all three of the IMI subscales (interest/enjoyment, $r = .70, p < .01$; perceived competence, $r = .42, p < .01$; importance/effort, $r = .43, p < .01$), suggesting a consistently positive affect and intrinsic motivation experience for some participants. A negative relationship was only observed between negative affect and perceived competence ($r = -.24, p < .05$), suggesting that higher negative affect was linked with lower perceptions of competence. Finally, there were some statistically significant relationships among the three IMI subscales in that the interest and enjoyment subscale was positively related to ratings for both perceived competence ($r = .36, p < .01$) and importance and effort ($r = .41, p < .01$).

6.4.5 Summary of Findings

To summarize the findings of Study 3:

1. *Statistically significant support for Hypothesis 1: those primed with a mastery goal persisted more than those in the performance and neutral conditions.*
2. *No support for Hypothesis 2: performance goal primed participants had the highest positive affect ratings, followed by the mastery and then neutral conditions, although none of these differences reached significance.*
3. *No support for Hypothesis 3: mastery goal primed participants had the highest negative affect ratings, followed by the neutral group, and then the performance goal primed group, even though these differences failed to reach significance.*
4. *Limited support for Hypothesis 4: mastery goal primed participants reported the highest interest and enjoyment and importance and effort ratings, but performance goal primed participants reported the highest*

perceived competence; furthermore, all intrinsic motivation differences across groups failed to reach significance.

6.5 Discussion

The research question guiding this study asked *is it possible to prime an achievement goal such that it is reflected in achievement behavior?* Evaluating whether this question was answered by the current study requires defining firstly what evidence of a successful prime might look like, and secondly deciding if the study provided enough evidence to suggest that the constructs primed were likely to actually have been achievement goals. In this study, evidence that the priming procedure had been successful was defined in terms of reliable behavioral differences across priming conditions and the exclusion of alternative explanations. Support that achievement goals had been primed was defined in terms of the alignment of these behavioral, as well as affect and intrinsic motivation, differences with predictions about performance and mastery goals according to achievement goal theory. The study found preliminary support for both of these requirements, suggesting that achievement goals can indeed be nonconsciously activated.

In terms of evidence that the priming procedure had been successful, the study found important differences in persistence behavior across the priming conditions. Those who were exposed to synonyms of mastery goal-related words on the Scrambled Sentence Test consistently persisted longer in the face of failure than those in the neutral condition, followed by those in the performance goal priming condition. This was especially the case with the persistence measure of average attempts made on anagrams 1-3, and to a lesser extent also found with average time spent. In terms of threats to the internal validity of the priming and behavioral variable link, one potential question is whether participants may have pursued a goal different to the one implied by the priming procedure. This was a criticism made of experimental manipulations of achievement goals in Chapter 2, where researchers tried to induce an achievement goal and examine its impact on behavior (Elliot & Harackiewicz, 1996). However, for this study, this is likely to have influenced the achievement behavior, and yet the study found a consistent pattern of

behavior differences across all groups. A somewhat linked question is whether some participants may have been harder to prime than others. However, due to the random allocation of priming conditions, such individual attributes are likely to have been divided equally across conditions. A further potential threat to the internal validity of any priming study is the possibility that participants may have become aware of a connection between the priming task and the achievement task presented by the researcher as ostensibly unrelated.

However, during the funnelled debriefing procedure, none of the participants reported suspicion of any influence of the Scrambled Sentence Test on the anagrams task, which Bargh and colleagues (Bargh, Chen, & Burrows, 1996) have suggested is crucial to the findings as “diametrically opposite effects on judgments are obtained if the participant is aware versus not aware of a possible influence by the priming stimuli” (p. 237). Ultimately, these arguments suggest that the differences in the contents of the Scrambled Sentences Test are likely to have explained the differences in participants’ persistence achievement behavior on the anagrams task. In other words, the priming procedure is likely to have been successful.

In terms of answering then whether the priming procedure was successful in nonconsciously activating achievement goals, two related questions need to be considered: whether what was primed was a goal, and whether it was an achievement goal. Firstly, it is likely that the construct primed in this study was a nonconscious goal. Support for this comes from research by Bargh and colleagues. In a series of experiments by Chartrand and Bargh (1996), the goals of impression formation and memorization were nonconsciously primed to replicate the results of an earlier study that asked participants explicitly to follow these goals (Hamilton, Katz, & Leirer, 1980). Similarly, in the first experiment of Bargh and colleagues’ (Bargh et al., 2001) series of studies exploring nonconscious goal pursuit, those participants who were primed with achievement related words found more words in a word puzzle task than those who were not primed with achievement related words. While the former study demonstrates that evidence of nonconsciously activated goals can be gleaned from whether participants “move in the direction of one versus the other specified outcome” (Bargh et al., 2001, p. 1016), the latter study demonstrates

that evidence of nonconsciously activated attainment goals can be gleaned from engagement in “content-free features, such as vigorous acting toward goal attainment, persistence in the face of obstacles, and resumption after disruption” (2001, p. 1016).³⁹

In the current study, participants in the two priming conditions indeed moved in the directions of the specified performance and mastery goal outcomes, and participants in the mastery goal priming condition indeed seemed to act toward goal attainment and pursue the goal in the face of the obstacle represented by the induced failure paradigm. Furthermore, control group participants reported lower positive affect than both goal-priming conditions; although the group differences for this finding did not reach significance, the suggestion is that perhaps something goal-related was activated. Interestingly, where Bargh and colleagues' study (experiment 1, Bargh et al., 2001) showed that participants who had been primed with the goal to perform did better than those in the neutral condition, the current study showed a distinction between the two priming conditions in that while mastery goal-primed participants persisted longer ($M = 464$ seconds) and made more attempts ($M = 14.57$) than those in the neutral condition (time spent $M = 429$ seconds; attempts made $M = 11.82$), performance goal-primed participants, although behaving differently from those in the neutral condition, actually persisted for less time ($M = 329$ seconds) and made less attempts ($M = 8.29$). Furthermore, this occurred without any negatively valenced words in the Scrambled Sentence Test that that might have inhibited achievement behavior.

The pivotal difference here may be the use of an induced failure procedure, resulting in the different responses from the two priming conditions.

Interestingly, these different achievement responses were in line with the patterns expected according to achievement goal theory. The findings thus suggest that achievement goals were successfully primed. The findings also support the utility of the using the Scrambled Sentence Test to prime

³⁹ The findings of the third study in this series also provide support that “the priming effects on task performance...were unlikely to have been mediated by an activated perceptual, nonmotivational construct” (Bargh et al., 2001, p. 1021).

achievement goals, and the failure inducing anagrams task in differentiating across priming conditions. While the persistence findings are a promising beginning to exploring nonconscious achievement goal activation and operation, they are only tentative. Continued exploration might illuminate these behavioral findings further, for example by replicating the first study by Bargh and colleagues (Bargh et al., 2001), but adding in a second goal priming condition where failure on the achievement task is induced.

Adding to the tentativeness of the current findings are questions remaining about the participants' self-reported affect and intrinsic motivation. Indeed, it had been predicted that the pattern for highest positive affect would be mastery goal condition, neutral condition, and then performance goal condition, mirroring the pattern for highest persistence behavior. For highest negative affect, the predicted pattern was performance goal condition, mastery goal condition, and then neutral condition, as the latter condition had no goal activation and thus would have less reason for a negative "mystery mood" (Chartrand, 1999; Chartrand & Bargh, 2002). There was only a slight difference in positive affect reported by performance and mastery goal primed participants (performance $M = 25.42$, mastery $M = 25.33$), and both of the priming conditions reported higher positive affect than those in the neutral group (neutral $M = 22.92$). In terms of negative affect, the observed pattern showed greater differences in mean ratings: participants in the mastery goal priming condition gave the highest ratings ($M = 20.00$), followed by those in the neutral group ($M = 19.12$), and then only those in the performance goal priming condition ($M = 18.04$). Though the group means did not differ significantly, the observed trend in affect begs explanation.

One possibility is that in persisting less on the anagrams task than those in the neutral and mastery goal priming conditions, those in the performance goal priming condition may have protected themselves from becoming too negatively affected by the continued failure experience. Not only did those in the performance goal prime condition have similar positive affect ratings and lower negative affect than those in the mastery goal priming condition, they also reported similar interest and enjoyment to those in the mastery condition (performance $M = 4.16$, mastery $M = 4.24$), and had the highest perceived

competence ratings (performance $M = 2.17$, neutral $M = 1.87$, mastery $M = 1.78$). Hence, although those in the performance goal priming condition were unable to accomplish their goal to demonstrate competence, their experience was not as negative as it could have been had they expended more effort and still been unable to demonstrate competence. This might suggest why those in the mastery goal condition, who had spent longer persevering in the face of failure, and were similarly unable to attain their goal of developing competence, experienced greater negative affect and lower perceived competence than either those who did not have a goal (neutral condition) and those in the performance goal priming condition. Although a potentially reasonable explanation, no significant correlation was found in the *post hoc* correlational analysis between persistence and affect: greater persistence on the anagrams task was not statistically significantly related to increasing negative affect, nor was less persistence statistically significantly related to increasing positive affect. Similarly, no significant relationship emerged between persistence and interest and enjoyment or perceived competence.

Another more methodological reason for the divergence between the predicted and observed pattern of affect and intrinsic motivation across priming conditions may be the difference in the types of measures. While the nonconscious prime was consistent with the behavioral persistence in that neither was self-reported, the affect and intrinsic motivation ratings may have failed to show the predicted differentiation along priming condition lines because they relied on conscious self-report. The exception here was the importance and effort subscale of the IMI, which showed a statistically significant positive correlation with time persistence ($r = .35, p < .01$) and attempts ($r = .37, p < .01$). However, this subscale differs from the other self-report measures in this study in that it relies solely on an estimation of one's easily perceivable outward behavior, with items such as "I put a lot of effort into this", "I didn't put much energy into this", rather than assessments of one's internal states (affect, interest and enjoyment, and perceived competence). Hence, the overall disjunction between conscious and nonconscious methods may suggest that goals that are nonconsciously pursued may impact behavior but not become explicit enough for participants to comment on them in self-

report questionnaires, possibly reflecting the operation of a dual process model between consciously and nonconsciously pursued and experienced goals (see Section 4.2.5). Although Bargh and colleagues (Bargh et al., 2001) note that just because participants are found to be unaware of the activation of a certain goal “does not necessarily mean that they were not aware of its operation” (p. 1017), when they tested this possibility, Bargh and colleagues (study 2, Bargh et al., 2001) failed to find evidence that participants did become aware of the operation of the nonconsciously activated prime. As such, this may represent an explanation for the convergence between the expected and observed patterns for nonconscious prime and behavior and the divergence with the majority of self-reported ratings.

6.6 Conclusion

This study showed that priming performance and mastery goals led to different persistence behaviors on an induced failure task: on average, mastery goal-primed participants spent longer and made more attempts than those in the neutral group, followed by those primed with performance goals. There were significant differences in persistence across groups in terms of average attempts made. For persistence in terms of average amount of time spent, the trend was in the right direction as suggested by significant differences across performance and mastery groups. Although this latter result renders the overall finding tentative, further studies should help to explore the influence of achievement goal priming on behavioral persistence at achievement tasks. Overall, this study should be taken as providing some very preliminary support for the possibility of nonconsciously operating achievement goals.

One of the interesting possibilities that stems from this study and also fits with the potential explanations of the first study comparing implicit and explicit achievement goal methods, is that while priming may be linked with non-self-reported methods, there may be a disjunction between these two nonconscious methods and self-report methods. While the stories we tell ourselves about our achievement are undoubtedly important in guiding our conscious achievement behaviors, the majority of our everyday achievement behavior is unlikely to be consciously initiated and controlled, as argued in Chapter 3. As such,

achievement goal researchers must continue to explore what cognitively unconscious achievement goal-driven behavior may look like. Given the possibility suggested by this study that achievement goals can be nonconsciously activated and influence achievement behavior without turning up in conscious reports (either in the funnelled debriefing or the affect and intrinsic motivation measures), the next study attempts to explore the possibility of a line of consistency across implicit methods in contrast with explicit methods by priming participants and then providing them with either an implicit or an explicit achievement goal method.

7 Study 4 Which achievement goal method captures primed achievement goals?

Introduction

This chapter completes the preliminary series of empirical explorations assessing *the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through designing and running a series of studies to empirically test if achievement goals can operate and be captured without conscious awareness* (Aim 3b of the thesis). So far, three studies have been conducted to explore the nature and possibility of the nonconscious operation and measurement of achievement goals. Study 1 indicated that both achievement goal-adapted IATs were reliable but that the explicit, self-report statements endorsed by participants did not correlate with their IAT reaction times. Study 2 indicated that while the Valence IAT was again reliable, it was no more consistent with achievement behavior in terms of persistence than the AGQ-R, and persistence behavior was not accompanied by theorized differences in affect and intrinsic motivation. In Study 3, priming participants with achievement goals was found to be consistent with behavior on a subsequent achievement task, but not with self-reported affect and measures of intrinsic motivation.

In summary, the first study compared implicit and explicit achievement goal methods, the second study implicit and explicit achievement goal methods and achievement behavior, and the third study priming, achievement behavior, and general achievement-relevant explicit methods. In this fourth study, achievement goals are primed and goal condition is compared directly with explicit and implicit achievement goal methods (see Table 29). As such, this fourth study addresses aim 3b(iv) by *conducting a comparison between nonconscious activation and implicit and explicit achievement goal methods*, and asks *does nonconscious activation of achievement goals lead to consistent responses on achievement goal methods?*

Table 29. Summary of methods compared in the empirical studies of this thesis

	Implicit Method	Explicit Method	Priming	Behavior
Study 1	•	•		
Study 2	•	•		•
Study 3			•	•
Study 4	•	•	•	

This chapter starts off by providing the background to Study 4, before describing the procedure. 32 participants were randomly allocated to performance or mastery priming conditions and primed using the same supraliminal priming task as in Study 3, the Scrambled Sentence Test. Following the priming procedure, half of the sample completed the Achievement Goal Questionnaire-*Revised* (AGQ-R, Elliot & Murayama, 2008) while the other half completed the Valence IAT designed and tested in Studies 1 and 2. The results are presented and discussed, before the thesis moves on to a general discussion and conclusion in the next chapter.

7.1 Background

In this thesis, it has been argued that achievement goal researchers should begin to consider the implications of findings on implicit cognition. These findings suggest that people often tell more than they can know, that conscious will is more an experience than a causal force, and that goals can be activated, pursued and fulfilled without conscious awareness. The experiments in this thesis have begun to explore the extent to which the implications of these findings apply to achievement goals in two ways. The first two experiments in this thesis explored how nonconscious goals might be captured, thereby providing a tool which may aid in their exploration, whereas the latter two experiments examine the potential for nonconscious activation of achievement goals, with the implication that if they can be activated outside of awareness, achievement goal researchers need to reconsider their definitions and operationalizations.

The findings of Study 3 suggest that achievement goals, like other cognitive representations studied by Bargh and colleagues (Bargh & Chartrand, 1999; Bargh et al., 2001), can indeed be activated outside of conscious awareness to

influence behavior. However, the findings are also dissimilar to those of Bargh and colleagues (Chartrand, 1999; Chartrand & Bargh, 2002) who found that assigning a difficult task to those who have been nonconsciously primed with the goal *to achieve* can result in the experience of negative ‘mystery moods’. Translating this latter ‘mystery moods’ finding to Study 3, and in line with the study’s predictions for achievement goal responses to induced failure, the pattern for lowest negative affect should have been topped by those in the neutral group: they had nothing specific to accomplish, so the induced failure should not have made them experience any more negative affect than those who *had* been primed with an achievement goal. Of these latter groups, in terms of negative affect, next would follow those in the mastery goal condition who should experience a slightly negative affect due to being unable to develop their competence, but not an extremely negative affect given that they had exerted a significant and satisfying amount of effort. Those with the highest negative and lowest positive affect should be those in the performance goal priming condition, as they had not been able to demonstrate their competence and also could not feel satisfaction given that expending effort and still failing would demonstrate even lower competence. However, even if these patterns were experienced, they were not reported as such on the self-report affect and intrinsic motivation subscales.

One potential explanation offered was that in persisting less, performance goal primed participants might have protected their affect, interest and perceptions of competence. However, given that the study failed to find a significant relationship between either of the persistence variables and affect and intrinsic motivation, with the exception of importance and effort, an alternative hypothesis was presented. This potential explanation was methodological and could be tested, and as such, it is tested in this study.

This alternative explanation is that perhaps the expected group differences failed to emerge because the methods operate along different dimensions of the implicit and explicit. In other words, affect and intrinsic motivation were both accessed using explicit, self-report methods, whereas both the priming and persistence indicators were implicit and did not rely on self-report. As such, this distinction between explicit and implicit, or self- and non-self-report methods,

would imply that an achievement goal could be nonconsciously activated and influence behavior, as perceived by the researcher who was blind to condition membership. Simultaneously, however, the effects of the goal on the participants' behavior would be unperceivable to the participant and thus fail to emerge on the self-report questionnaires. Indeed, a study by Bargh and colleagues (experiment 2, Bargh et al., 2001) found that primed participants did not become aware of the operation of the nonconsciously activated prime.

To begin exploring this issue, the current experiment employs the priming procedure from Study 3. Once participants have completed the priming task, they complete either an implicit or an explicit achievement goal method. In this way, it is possible to assess the correspondence between priming condition and the achievement goal the participant either implies on the implicit method or endorses on the explicit method. This study also further explores whether the priming that elicited statistically significant behavioral differences in the previous study was indeed activating an *achievement goal*. As Study 1 suggested that implicit and explicit achievement goal methods breed divergent findings, Study 4 should help to explore which method, both, or neither might capture a nonconsciously activated goal. Given that Study 2 suggested persistence behavior on an achievement task was only captured by the achievement goal methods about half of the time, and similarly across the implicit and explicit methods, each method should be consistent with the priming condition for half of the sample in the current study. However, if the potential explanation about the consistency of implicitly collected, non-self-report methods is likely, the priming in this study should be consistent with the implicit method, the Valence Implicit Association Test, more than it is consistent with an explicit method, the Achievement Goal Questionnaire-Revised (AGQ-R, Elliot & Murayama, 2008).

Hence, the primary aim of the current study was to conduct a comparison between the independent variable of randomly allocated goal priming and the dependent variable of an achievement goal method (i.e., AGQ-R responses or Valence IAT score). As mentioned in the introduction, the overarching question guiding this research is: *Are the implications of research on implicit cognition applicable to achievement goal theory?* Given that Study 3 suggested it is possible to prime achievement goals so that they influence participants' persistence

behavior on an achievement task outside of conscious awareness, the current study explored the methodological ramifications of this finding by asking the specific research question *does nonconscious activation of achievement goals lead to consistent responses on achievement goal methods?*

7.1.1 Possible Outcomes for Study 4

There were four possible outcomes for this study, shown in Table 30, but no hypotheses. The first possible outcome was that the nonconsciously primed goal would be consistent with participants' Valence IAT scores *and* with participants' subscale scores on the AGQ-R. This outcome would suggest that, on the Valence IAT, a participant primed with a performance goal would more quickly categorize positive and performance stimuli to the combined category of Performance Goals and Good than positive and mastery stimuli to the combined category of Mastery and Good on the Valence IAT. This outcome would also suggest that, on the AGQ-R, a participant primed with a performance goal would rate items from the performance subscales more highly than the items on the mastery goal subscales. This finding would replicate partially the finding of Study 2 where both methods captured the achievement goal. The remaining question would be whether the achievement goal methods were consistent with the prime more than they were inconsistent with the prime.

Table 30. Possible outcomes for Study 4: Consistency with primed goal

Outcome	AGQ-R	Valence IAT
1	✓	✓
2	✗	✓
3	✓	✗
4	✗	✗

As shown in Table 30, the second possibility was that the nonconsciously primed goal would be consistent with the Valence IAT scores and *not with the* AGQ-R. This possibility would provide support for the hypothesis offered in the previous study, that nonconscious achievement goals are unavailable to conscious self-report, while exerting an influence on behavior. This would be in line with the finding of Bargh and colleagues (experiment 2, Bargh et al., 2001) that participants who had been primed were unaware of both the activation and

operation of the primed goal. The remaining possibilities were that the primed goal would be consistent with the AGQ-R and not the Valence IAT, or inconsistent with both achievement goal methods.

7.2 Method

7.2.1 Participants

Participants were 32 students enrolled in different faculties at a university in the northeast of England. There were 27 female and 5 male students in the sample. All participants were undergraduate (years 1-4) volunteers, recruited from lectures in the School of Education and School of Applied Social Sciences at which the researcher advertised the study during brief pre-lecture calls for participants.

7.2.2 Materials

7.2.2.1 Priming Task

The priming task was the Scrambled Sentence Test (Bargh & Chartrand, 2000; Kawada, Oettingen, Gollwitzer, & Bargh, 2004; Srull & Wyer, 1979) as in the previous study. Given that significant differences were found between the performance and mastery goal primed groups, and not between either of these two groups and the neutral condition, in addition to the focus of the current experiment on ascertaining whether the primed goal matched the captured goal, only the performance and mastery goal versions of the Scrambled Sentence Test were employed. As before, the performance goal version had 25 scrambled sentences, 10 of which included a performance word such as *compete*, *win*, or *outperform*, while the mastery goal version included words such as *learn*, *improve*, and *progress*. Once again, the task instructions led participants to believe they were completing a test of language ability, and asked them to construct complete, coherent, grammatically correct sentences using four out of the five available words.

7.2.2.2 Achievement Goal Methods

As achievement goal methods, the Achievement Goal Questionnaire-*Revised* (AGQ-R, Elliot & Murayama, 2008) represented the explicit, self-report

measure, while the Valence IAT was used as the implicit measure. The Valence IAT was used instead of the Self/Other Referent IAT because the former showed greater internal consistency when tested in Study 1 (see Chapter 4, Valence $r = .80, p < .001$; Self/Other $r = .55, p < .05$).

7.2.3 Procedure

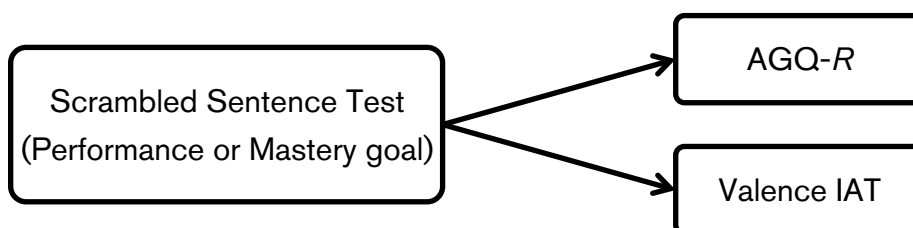


Figure 19. Study 4 methods

An overview of the procedure is illustrated in *Figure 19*. All participants were run individually in a room free from noise and distractions. On arrival to the room, participants were invited to sit at a desk with the consent form (see Appendix 10.4.1) and an envelope on it. Once they had completed the consent form, they were instructed to pick any one piece of folded paper randomly from the envelope and complete it. The envelope contained the Scrambled Sentence Test for the two goal priming conditions (performance and mastery).

Once participants had finished the Scrambled Sentence Test, they were instructed to fold it and put it to the side. This process ensured that the researcher was blind to the participants' condition. Though priming condition was randomly assigned by picking a Scrambled Sentence Test out of the envelope on the table, the assignment of AGQ-R or achievement goal Valence IAT was conducted by administering the former to the first 16 participants and the latter to the remaining 16 participants. As in Study 1 and 2, presentation of the Valence IAT was counterbalanced in order to correct for any ordering effects.

Once participants had completed their assigned achievement goal method, the researcher engaged each participant in funnelled debriefing (Bargh & Chartrand, 2000, p. 285) to determine what the participants thought the aim of the experiment was, if they were suspicious about any aspects of it, whether

they thought the tasks were related, and whether they noted any theme recurring throughout the study (see Appendix 10.4.2). The researcher then provided each participant with a full debrief in accordance with suggestions made during the ethics review, given the limited information provided during recruitment, the use of a cover story for the priming task, the nonconscious activation, and the covert measurement of response times by the IAT. The researcher further described the purpose of the experiment within the research programme, answered any questions participants had, and presented participants with the opportunity to revisit the priming task they had completed and their IAT score. Finally, participants were thanked and dismissed.

7.3 Results

7.3.1 Priming Condition and Achievement Goal Method: Consistent or Inconsistent?

Given that each of the 32 participants picked either a performance or mastery Scrambled Sentence Test out of the envelope at the beginning of the experiment, each priming condition contained 16 participants. The first sixteen participants completed the AGQ-R and the remaining 16 were administered the Valence IAT, so that the eventual composition of each group was roughly equal, as shown in Table 31 below.

Table 31. Participants by priming condition and achievement goal method

Priming Condition	Achievement Goal Method		Total
	AGQ-R	Valence IAT	
Performance	9	7	16
Mastery	7	9	16
Total	16	16	32

Note. AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Implicit Association Test.

Subscale means were calculated for each of the AGQ-R scales (PAP, PAV, MAP, MAV) and then, to match the dichotomous goal model configurations of both the priming procedure and the Valence IAT, the performance subscales were averaged into a single performance average (P_Avg). The same was done to create a single mastery average (M_Avg). Because the presentation of the Valence IAT had been counterbalanced, the scores were standardized so that a

positive score represented a performance preference, whereas a negative score represented a mastery preference. The group means for each priming condition in terms of performance and mastery averages on the AGQ-R and standardized Valence IAT scores are presented in Table 32.

Table 32. Achievement goal method means by priming condition

Priming Condition	Variable of Interest	<i>n</i>	<i>Mean</i>	<i>Min.</i>	<i>Max.</i>	<i>SD</i>
Performance	P_Avg	9	3.00	1.00	5.00	1.26
	M_Avg	9	3.56	2.50	4.50	0.62
	IAT Score	7	.0672	-.3865	.7125	0.37
Mastery	P_Avg	7	3.29	2.33	3.67	0.46
	M_Avg	7	3.76	3.50	4.17	0.25
	IAT Score	9	.0153	-.4074	.5491	0.31

Note. M_Avg = mean of mastery approach and avoidance subscales, P_Avg = mean of performance approach and avoidance subscales, IAT = Implicit Association Test, *n* = number of participants per condition, *M* = mean, *Min.* = minimum, *Max.* = maximum, *SD* = standard deviation.

The data in Table 32 show that those in the performance priming condition who took the AGQ-R did not (on average) rate performance items more highly than they rated mastery items. Those in the mastery priming condition who took the AGQ-R did however rate mastery items more highly on average than performance items. Concerning Valence IAT scores, across the entire sample, those in the mastery priming condition had lower IAT scores than those in the performance priming condition. This finding suggests consistency between the primed goal and the Valence IAT, with the lower, more negative scores representing quicker responses to the second combined category (i.e., Mastery Goals paired with Good), and positive, higher scores representing a preference for the first combined category (i.e., Performance Goals paired with Good). However, although the mean IAT scores for those in the mastery goal priming condition were lower than for those in the performance condition, they remained positive and were thus indicative of a slight performance preference. Independent samples t-tests comparing each of the achievement goal method scores (see Table 32) across the two priming conditions failed to reach significance (all p 's > .36⁴⁰). In sum, there was correspondence between the

⁴⁰ Cohen's d for each of the t-tests (calculated in the direction performance then mastery): Priming Condition by P_Avg: $d = -0.31$; Priming condition by M_Avg: $d = -0.42$; priming condition by IAT score: $d = 0.15$.

responses of those who were primed with mastery and took the AGQ-R and those who were primed with performance and took the Valence IAT.

In order to answer the research question of whether the nonconscious activation of achievement goals led to consistent responses on the achievement goal methods, a count was taken of how many participants primed with each achievement goal reported or reacted consistently with this goal on the AGQ-R or the Valence IAT. The results of this count are shown in Table 33 below.

Table 33. Consistency of responses by priming condition and achievement goal method

Priming Condition		AGQ-R	Valence IAT	Total
Performance	Consistent	3	5	8
	Inconsistent	6	2	8
	Total	9	7	16
Mastery	Consistent	5	6	11
	Inconsistent	2	3	5
	Total	7	9	16
Total	Consistent	8	11	19
	Inconsistent	8	5	13
	Total	16	16	32

Note. AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Implicit Association Test.

Overall, priming condition and achievement goal method were consistent for 19 participants out of the total 32, suggesting that the achievement goal methods were consistent with the priming condition for almost 60% of the participants. Out of these instances of consistency, the Valence IAT was slightly more consistent than the AGQ-R. The Valence IAT was consistent a total of 11 times (5 times in the performance condition, 6 times in the mastery condition) while the AGQ-R was consistent a total of 8 times (3 times in the performance condition, 5 times in the mastery condition). There was greater consistency for those who were primed with a mastery goal (11 consistent versus 5 inconsistent) than for a performance goal (8 consistent and 8 inconsistent). However, when Chi-Square tests were run to assess whether the consistency was dependent on

either priming condition or achievement goal method, neither result reached statistical significance ($\chi^2 [1, N = 32] = 1.17, p = .28$).⁴¹

7.3.2 Reliability

These consistency findings must be taken with care, as reliability for both of the achievement goal methods was low. Although the Valence IAT had been shown to be reliable in both Study 1 and Study 2, in the current study the internal consistency coefficient for the Valence IAT was much lower than before, failing to reach significance at $r = .43, p = .10$.⁴² The reliability of the AGQ-R was similarly affected, with acceptable alphas for both performance subscales (PAP, 3 items, $\alpha = .93$; PAV, 3 items, $\alpha = .80$), but considerably lower alphas for both mastery subscales (MAP, 3 items, $\alpha = .44$, MAV, 3 items, $\alpha = .24$). Possible reasons for these low reliability coefficients, as well as why this study was retained in the thesis despite the low reliability of its methods, are presented in the discussion.

7.4 Discussion

The current study was conducted to answer the question *does nonconscious activation of achievement goals lead to consistent responses on achievement goal methods?* Two phases of analysis were carried out to answer this question, each with a different way of defining consistency.

The first definition of consistency between the primed goals and the achievement goal methods was at the level of predicted group differences. Consistency would be observed if those in the performance goal prime condition had higher average performance ratings on the AGQ-R or Valence IAT scores that reflected quicker responses to the Performance Goals and Good combined category, and *vice versa* for mastery goal primed participants. The findings using this definition of consistency suggest that on the AGQ-R, nonconscious activation of achievement goals was only consistent with the

⁴¹ Both sets of groups had the same expected, observed, degrees of freedom, and chi-square results (AGQ-R: 8 consistent, 8 inconsistent; IAT: 11 consistent, 5 inconsistent; Performance Prime: 8 consistent, 8 inconsistent; Mastery prime: 11 consistent, 5 inconsistent).

⁴² Again, this is calculated by correlating IAT scores at the end of the first half of stages 3 and 5 (pooled) with their IAT score for the latter half of stages 3 and 5 (pooled).

responses provided by those mastery goal primed participants. Indeed, those primed with mastery goals rated mastery items more highly on average than performance items, while those primed with performance goals actually reported higher average ratings for mastery, instead of the predicted higher average ratings for performance items.

On the Valence IAT, the findings using this definition of consistency suggest that the nonconscious activation of achievement goals was only consistent with the IAT scores of those primed with performance goals. Indeed, those primed with performance goals had IAT scores that were higher and positive, while those who were primed with mastery goals had IAT scores that, despite being lower than those of the performance goal primed participants, remained very slightly positive, instead of the negative scores that characterize a mastery preference (i.e., quicker reactions in block 5, Mastery Goal and Good).

According to this definition of consistency, then, each method was only consistent with one of the primed achievement goals: the AGQ-R with mastery goals and the Valence IAT with performance goals. At the group level, the consistency observed partially reflects both possible outcomes 1 (consistent-consistent) and 4 (inconsistent-inconsistent), discussed in Section 7.1.1.

The second definition of consistency between the primed goals and the achievement goal methods was at the level of each individual participant. Here consistency would be observed *if each participant* who had been primed with a performance goal rated performance items more highly than mastery items on the AGQ-R, or emerged with a larger, positive IAT score, and *vice versa* for mastery goal primed participants. The findings using this definition of consistency suggest that the nonconscious activation of achievement goals was consistent with the findings of the combined achievement goal methods for more than half of the participants. Although the following differences failed to reach significance, greater consistency was observed for those primed with mastery goals and those who completed the Valence IAT than for those primed with performance goals and those who completed the AGQ-R.

The finding that more consistency between the priming condition and achievement goal method was observed for those taking the Valence IAT than

the AGQ-R is in line with possible outcome 2 (see Section 7.1.1). As such, this finding is in line with the alternative explanation proposed in the discussion of Study 3, that nonconscious goal activation is more likely to be captured by non-self-report methods. However, given that the difference between greater consistency on the Valence IAT than on the AGQ-R failed to reach significance, more research will be needed to explore this further, with a larger sample size that will not mask a potentially significant difference in consistency between priming condition and self-report and non-self-report methods.

One underlying but crucial issue with this study was the low reliability for the mastery subscales and the Valence IAT. On one hand, this may be seen as less problematic in terms of the first definition of consistency: at the group level, an assessment of consistency could be made using the average performance ratings, as the performance subscales showed appropriate reliability. As such, consistency could be explored for half of the sample: those who took the AGQ-R. Accordingly, on the basis of the performance subscales, performance goal primed participants would be predicted to have higher performance ratings than mastery goal primed participants, and mastery goal primed participants would be predicted to have lower performance ratings than performance goal primed participants. However, this pattern did not emerge in the current study, and mastery goal primed participants had higher performance ratings than performance goal primed participants. On the other hand, the low reliability was problematic at this level of consistency analysis in that no confident comparison could then be made for the other half of the sample, between the priming condition and the IAT scores, as this measure did not show appropriate internal consistency. In terms of the second definition of consistency, assessed at the individual level, the low reliability is problematic across the entire sample. Judgments of consistency between priming condition and achievement goal method for each participant were based on, for example, whether a performance goal primed participant had a higher performance average than mastery average, or had a positive rather than a negative IAT score. Such comparisons thus required reliable mastery averages as well as a reliable IAT, and these were unfortunately not achieved in this study.

Future studies could work towards replicating this study and exploring the reasons for this low reliability in order to better answer if nonconsciously activated achievement goals lead to consistent responses on achievement goal methods. It is possible that the participants in this particular sample may have had some problem in understanding the mastery items on the achievement goal questionnaire, leading to a greater variance in their responses to different items from the same achievement goal subscale. However, this does not explain why the IAT also lacked appropriate internal consistency.

A possible explanation for the low reliabilities is the small sample size. In this study only 16 participants completed each achievement goal method. However, an interesting point to note, and part of the reason this study was retained despite its low reliabilities, is that the second study of this thesis did not find low reliability coefficients for either the mastery subscales or the Valence IAT despite having just fewer than ten participants more in each goal method condition (i.e., 25 completed AGQ-R, 25 completed Valence IAT). As such, and perhaps the main reason this study is included despite its low reliabilities, there is also a possibility that the priming procedure may have impacted on the reliabilities of the two goal methods, such that being primed with a performance goal might elicit erratic responses on mastery subscale items, and *vice versa*. The results of this analysis, based on splitting the sample by priming condition to assess whether there were differences in reliability of the AGQ-R and the Valence IAT, are reported in the appendix (see Appendix 10.4.3). Crucially, splitting the sample by priming condition resulted in even smaller sample sizes (i.e., only 9 out of the performance goal primed participants took the AGQ-R), so no confident findings can be reported. Future studies with a greater sample size should help to explore this possibility of a sort of interference from priming on capturing achievement goal methods.

An approach that could be used to explore the possibility that the priming procedure impacted on the reliability of the achievement goal methods is the inclusion of a neutral condition in future studies. This would aid in isolating whether the low reliabilities observed in this study are linked with the priming of achievement goals or were just a feature of the current sample. As such, the reliabilities for achievement goal methods completed by those in each of the

primed conditions could be compared with the reliabilities of achievement goal methods completed by those not primed with an achievement goal. As stated in the methods section (see Section 7.2.2.1), a neutral condition was not included in the design of the current experiment because the previous study had shown significant behavioral differences between the two goal priming conditions. Furthermore, the current experiment only tried to assess whether those who were primed with a specific achievement goal also responded in line with this goal on an achievement goal measure. Including a neutral condition in future studies will be especially important given that the priming procedure in Study 3 failed to produce the same low reliabilities on the self-report affect and intrinsic motivation methods. Further studies should therefore help in highlighting whether the low reliabilities observed in this study may have resulted from the shared focus on achievement goals of both the priming procedure and the outcome methods (AGQ-R, Valence IAT).

7.5 Conclusion

This study showed that nonconsciously activated achievement goals were on the whole more consistent than inconsistent with responses to achievement goal methods. Specifically, primed achievement goals and responses to the achievement goal methods were more consistent for those who had been primed with mastery goals and for those who completed the Valence IAT than for those who had been primed with performance goals and for those who had completed the AGQ-R. This provides some support for the hypothesis that an implicit method is more likely to capture an implicitly activated goal. However, due to the lack of significant differences and the low reliability of the mastery subscales of the AGQ-R and the Valence IAT, the confidence in the findings of Study 4 is also low. Further studies should thus continue to explore not only whether nonconscious activation of achievement goals is more consistent with non-self-report methods, as suggested by Study 3, but also whether priming achievement goals systematically impacts on students' responses to implicit and explicit achievement goal methods.

8 General Discussion and Conclusion

Introduction

The current chapter consists of a general discussion followed by an overall conclusion. The discussion section summarizes the main arguments and then considers the findings from each of the empirical chapters, outlining their limitations, discussing their implications for achievement goal research, and recommending directions for further study. Following this summary of the thesis, the chapter underlines the overall contributions to knowledge that are made by this thesis. The chapter and this thesis then conclude in answering the final, forward-looking research question, *given the implications of research on implicit cognition, and a reasoned argument and evidence from a series of empirical studies on their applicability to achievement goals, are there any changes that might need to be made to how achievement goals are theorized and the methods used to capture them?*

8.1 General Discussion

As laid out in the introduction of this thesis, the primary aim of the current work has been to explore the nature and methodological implications of the possibility for nonconscious *achievement goal* pursuit. The guiding objectives have been to:

1. *Understand current operationalizations of achievement goals and the assumptions underlying them* (Chapter 2);
2. *Examine the literature on implicit cognition and nonconscious goal pursuit and identify the key implications of these literatures for the definition and operationalization of achievement goals* (Chapter 3);
3. *Assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through*
 - a. *reasoned argument* (Chapter 3);
 - b. *designing and running a series of studies to empirically test if achievement goals can operate and be captured without conscious awareness by:*

- i) *developing an implicit method to access achievement goals and comparing it with an explicit achievement goal method* (Chapter 4)
 - ii) *conducting a comparison between achievement behavior and implicit and explicit achievement goal methods* (Chapter 5)
 - iii) *exploring if achievement goals can be nonconsciously activated (primed) and subsequently influence achievement behavior* (Chapter 6)
 - iv) *conducting a comparison between nonconscious activation and implicit and explicit achievement goal methods* (Chapter 7)
4. *Finally, to suggest any potential changes to the model of achievement goals based on the arguments and findings resulting from the previous aims* (Current chapter).

8.1.1 Defining and operationalizing achievement goals

The first aim, *Understand current operationalizations of achievement goals and the assumptions underlying them*, was primarily addressed in Chapter 2. Chapter 2 explored the origins of achievement goals before considering current issues in their definition and measurement. Achievement goals were shown to draw from the achievement motivation work of Murray (1938), McClelland (McClelland, Atkinson, Clark, & Lowell, 1953), Lewin (Lewin, Dembo, Festinger, & Sears, 1944), Atkinson (1957, 1964) and Weiner (1972, 1974). Within this work, the explanation for achievement behavior developed from a stable, dispositional construct that was reactive and deficit reducing to a proactive motive, focused on the directedness of behavior. Later approaches incorporated the idea of approach and avoidance motivation, mathematical calculations of the tendency to approach success and avoid failure, the potential to pursue goals based on previous performance, and ideas about what individuals attribute their success and failure to. The early theories of achievement motivation mostly assumed that the various motivational constructs should be accessed using indirect, projective methods, implying some lack of possibility for introspection and instead the need for trained markers, but also to a smaller extent, self-reports (e.g., motive to avoid failure,

Test Anxiety Questionnaire), which seem to suggest otherwise. Achievement goals were discussed as having resulted from critiques of this work, which stressed that individuals' achievement behavior could not be entirely explained by dispositional motives and attribution, and that more attention should be paid to the role played by cognition and specific contexts. From this later, cognition-based work emerged the central competence-focused concepts of mastery and performance goals, which soon progressed from a dichotomous framework into a trichotomous, then a 2 x 2, and more recently, a 3 x 2 model.

Chapter 2 then went on to explore how, despite a vast theoretical and empirical literature, definitions of achievement goals are not always clearly elaborated: researchers often implicitly differ in how they define goals, construing them as purposes, orientations, or competence-focused aims. Further definitional issues have included what constitutes an *achievement* goal with regard to work avoidance, extrinsic, and social goals, whether an achievement goal includes the reason for the goal, whether an achievement goal is best conceptualized as trait-like or state-like, and how goals are cognitively represented. The overarching conclusion of this first section was that achievement goal theory as a field has struggled with consistently and consensually defining achievement goals. Although debate and disagreement are healthy features of research, a lack of acknowledgement of these issues in empirical work⁴³ has been problematic in terms of masking differences in assumptions underlying achievement goal methods. As a result, it has been more difficult to assess the cumulative results of achievement goal research and determine how this research can be used to improve learning and pedagogical practice.

Chapter 2 then critically examined how achievement goals have been operationalized and what these operationalizations have implied about researchers' assumptions regarding achievement goals. These methods have ranged from think aloud methods: real time, dynamic explorations of students' verbalizations on specific achievement tasks, which has valued individuals' motivation-related cognitions, but where researchers have ultimately derived

⁴³ As of course, has been well documented more generally by writers such as Senko, Hulleman, and Harackiewicz (2011) and Elliot and Murayama (2008).

the enacted achievement goal, to attempts at experimentally inducing goals through task descriptions that allude to normative or task-based evaluations of competence, which focus on the behavioral enactment of achievement goals in an attempt to avoid subjectivity and bias from self-report. More recent methods have included questionnaires, reflecting a greater interest in measuring rather than manipulating achievement goals, and interviews, which have been employed as a means for avoiding researcher-defined goals, enabling individuals to relay the achievement goals most pertinent to them. Both of these methods value individuals' input but assume that they have coherent achievement goals, that they know what their goals are, and that there is a mutual understanding between researchers and respondents regarding what achievement goals are. The weaknesses of each of these methods were highlighted, ranging from a lack of ecological validity to researcher-defined goals, from misunderstanding questionnaire items to impression management, and even the potential that individuals may not know or be conscious of what their achievement goals really are.

Chapter 2 thus provided an exploration and critique of current achievement goal assumptions and operationalizations. The findings of this endeavor are that there exist important underlying differences in the definitions and assumptions underlying achievement goal research. As such, methodologies can sometimes be in conflict with theory, lessening the quality of the evidence base and the overall utility of achievement goals as a construct. To advance more productively, achievement goal researchers need to be more explicit in how they are defining and purporting to access achievement goals, and to begin to acknowledge the weaknesses and assumptions underlying their methodology to ensure that what they are assessing is likely to be an achievement goal.

Table 34. Aim 1 summary

Aim	Findings	Future directions
-Understand current operationalizations of achievement goals and the assumptions underlying them	Underlying differences in: -Definitions (purpose, orientation, aim), -Operationalizations (causal experiments, correlational questionnaires, ecologically valid interviews), and -Assumptions (accessibility of goals, trait versus state, reasons versus goal complex)	-Make explicit all definitions, operationalizations, and assumptions -Ensure better correspondence between all definitions, operationalizations, and assumptions -Better translation of achievement goal research into improvements for pedagogy and practice

8.1.2 Research on implicit cognition and its implications for achievement goals

Chapter 3 addressed each of the first three aims: to *understand the assumptions underlying current operationalizations of achievement goals* (Aim 1), to *examine the literature on implicit cognition and nonconscious goal pursuit and identify the key implications of these literatures for the definition and operationalization of achievement goals* (Aim 2), and to *assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through reasoned argument* (Aim 3a).

Chapter 3 introduced current definitions of conscious and automatic mental processes in terms of awareness, intention, effort and control (Bargh & Chartrand, 1999), before outlining the key findings on implicit cognition. In line with work by Nisbett and Wilson (1977), it was argued that we often tell more than we can know, basing our responses about the motivations for our behavior not on the fruits of introspection but on *post hoc* rationalizations. Referencing work by Wegner (2002), it was suggested that our experience of a conscious, causal will is an illusion, and that our accounts of our intentioned behavior are instead based on principles of priority, consistency, and exclusivity (Wegner & Wheatley, 1999). Furthermore, from the findings of research on automaticity, it was suggested that the frequent and consistent presentation of similar

situations can result in a bypassing of conscious choice, such that individuals can pursue and accomplish complex, nonconsciously activated behavioral and cognitive goals without being aware or able to comment that this process has taken place (Bargh & Chartrand, 1999). Taken together, these key findings imply that if achievement goals are conceptualized as cognitively represented, then they, like other cognitive representations, can be activated to operate nonconsciously, such that any subsequent explanatory attempts can only be based on *post hoc* rationalizations. The further implication is that if this is possible, then achievement goals will be activated not only by experimentally manipulated nonconscious priming procedures, but also by facets of the achievement environments they encounter.

Chapter 3 then examined three phases of responses to such research from achievement goal theorists. Early responses were shown to be defensive, arguing that the question of conscious accessibility is irrelevant as achievement goals are unlike unconscious desires or motives in that they originate in the cognitive revolution (Pintrich, 2000; cf. Murphy & Alexander, 2000). Later responses seemed to approach a halfway point, in arguing that the definition of achievement goals requires that they are consciously committed to, but acknowledging research on implicit cognition by ceding that once they have been cognitively committed to, achievement goals can then be activated and operate without awareness (Elliot & Fryer, 2008). While these responses did not explore the implications of such a position, for example by questioning when conscious commitment occurs and how current self-report methods might access them, the latest responses have progressed by calling for research on the potential for nonconscious causal achievement goals and the interactions between conscious and nonconscious accounts (Murayama, Elliot, & Friedman, 2012; Pintrich, 2003). The implications of such calls are vast: they open up a theoretical space for further explorations. These explorations should involve not only whether (and how) achievement goals might be pursued and fulfilled nonconsciously, but also pivotal questions on how the cognitive representation of achievement goals might accommodate both conscious and nonconscious achievement goals. Furthermore, such explorations should examine methodological concerns over the validity of currently predominant self-report

methods, and discern how implicit methods can be adapted and validated to aid in the measurement of achievement goals.

In line with these calls, the final section of Chapter 3 examined several different implicit methods that could be used in the exploration of nonconscious achievement goals. While possibilities presented included projective tests such as the Thematic Apperception Test (Morgan & Murray, 1935; or more recently, Picture-Story Exercises, Thrash, Maruskin, & Martin, 2012), the Implicit Relational Assessment Procedure (IRAP, Barnes-Holmes, Barnes-Holmes, Power, Hayden, Milne, & Stewart, 2006), and the assessment of goal traces using specially designed learning software (e.g., Zhou & Winne, 2012), the two methods that were within the scope of a doctoral thesis and more readily adaptable comprised goal priming (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001) and the Implicit Association Test (IAT, Greenwald, McGhee, & Schwartz, 1998). These methods were hence the focus of the current empirical exploration of whether the implications of research on implicit cognition are applicable to achievement goals, but future work should carefully investigate the potential utility of a variety of implicit tools.

Table 35. Aim 1, 2, and 3a summary

Aim	Findings	Future directions
-Understand assumptions underlying current operationalizations of achievement goals (2 nd part of Aim 1) -Examine the literature on implicit cognition and nonconscious goal pursuit and identify the key implications of these literatures for the definition of and operationalization of achievement goals (Aim 2) -Assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through reasoned argument (Aim 3a)	-Definitions of conscious and automatic cognitive processes -We often tell more than we can know (Nisbett & Wilson, 1977) -Our experience of a conscious, causal will is an illusion (Wegner, 2002) -Behavioral and cognitive goals can be nonconsciously activated and pursued till fulfilment (Bargh & Chartrand, 1999) -Achievement goals are cognitively represented, should have the capacity to be nonconsciously activated and pursued -Limits of introspective ability, responses about motivation based on <i>post hoc</i> rationalization -Already existing implicit methods can be adapted to explore nonconscious achievement goals	-Exploration of possible nonconscious operation of achievement goals -Comparison of implicit and explicit methods for accessing achievement goals -Examine cognitive representation of achievement goals -Reassess purely conscious models, definitions, and operationalizations of achievement goals

8.1.3 Empirically Exploring the Applicability of Implicit Cognition Implications to Achievement Goals

The rest of the third aim was addressed across empirical Chapters 4 through 7 and was, to *assess the extent to which the implications of findings on implicit cognition and nonconscious goal pursuit apply to how achievement goals are currently theorized through designing and running a series of studies to empirically test if achievement goals can operate and be captured without conscious awareness* (Aim 3b). These chapters sought to answer the research question, *Are the implications of research on implicit cognition applicable to achievement goal theory?* Each chapter also had more specific research questions, as described in the

following sections. Two approaches were taken to answering this overarching question. One approach was based on the idea that there may be aspects of achievement goals that may not emerge via conscious, self-report methods, and involved the adaptation of an implicit method for assessing achievement goals. As such, the first two empirical chapters adapted and administered an implicit method and then compared its findings firstly with those of an achievement goal questionnaire and later, with behavior on an achievement task. The second approach was based on the finding of automaticity research, that goals can be pursued without conscious awareness, intention, control, or effort, and involved examining the potential for achievement goals to be primed to operate outside of conscious awareness and accessibility. As such, the second two empirical chapters attempted to prime achievement goals before comparing priming conditions firstly with behavior, affect, intrinsic motivation, and then with both implicit and explicit achievement goal methods.

8.1.3.1 Chapter Four: Study 1

Chapter 4 described the design decisions involved in adapting two achievement goal implicit association tests, the Valence IAT and the Self/Other Referent IAT, and also reported on a study comparing participants' responses to an Achievement Goal Questionnaire-Revised (AGQ-R, Elliot & Murayama, 2008). This chapter specifically asked, *can an implicit method for accessing achievement goals be designed? Are there differences between what an implicit versus an explicit method can tell us about a student's goals, and if so, what are they?* Once the achievement goal IATs had been adapted in line with recommendations for IAT design (Nosek, Greenwald, & Banaji, 2007), the comparison study allowed for an assessment to be made of their internal consistency. Although both methods achieved appropriate reliability, the Valence IAT emerged with a stronger internal consistency than the Self/Other Referent IAT, and was thus advanced as the implicit method to be used in other studies within the thesis. The study also found that the IATs and the AGQ-R did not correlate.

Two potential explanations for this divergence were advanced: one suggested the two methods were tapping differing aspects of a single underlying construct, while the other posited that the two methods could be accessing

different constructs. The first suggestion implies that IATs may represent an account of automatic, spontaneous behavior or cognition, whereas the AGQ-R represents an account of more controlled, deliberate behavior. An implication of this suggestion is that future achievement goal studies should employ both methods, building up an idea of what situations an implicit or explicit method might be more helpful in. A potential implication of the second suggestion is that only one of the methods, or neither, validly accessed students' achievement goals. Given the potential for nonconscious achievement goals and the limits to self-report, it was suggested that the IAT might be closer to accessing the goals individuals are likely to pursue in achievement settings, whereas self-report achievement goal questionnaires might only be tapping into a type of coherent, conscious account, or *achievement narrative* (see 4.2.5). Continued research should explore the predictive and concurrent validity of both methods. In sum, the findings alone could not indicate which of these explanations was more likely, and as such it was decided that a further study comparing both methods with participant behavior on an achievement method might help to determine if the methods were capturing relevant features of achievement goals or not.

Ultimately, Study 1 showed that it is possible to adapt an implicit method to assess achievement goals, but more research needs to be done to discern the validity of the Valence IAT. Such research needs to continue to explore what a Valence IAT score means, for example by asking if there are different degrees of preference or association, and to what extent a preference or association is representative of an individual's achievement goal or the likelihood that they will enact this goal in an achievement situation. Furthermore, continued research on the Valence IAT should explore the incorporation of approach and avoidance valences,⁴⁴ and even the 3 x 2 model, in addition to honing the

⁴⁴ For example, although Marzouq, Carr, and Slade's (2012) IAT-Type method is designed to capture reaction times for all four of the 2 x 2 achievement goal framework in one IAT, this requires the use of phrases as stimuli for categorization, representing a departure from the use of single words as stimuli on the original IAT (Greenwald, McGhee, & Schwartz, 1998). In future, the current Valence IAT could be developed to take into account approach and avoidance valences, and even the 3 x 2 model, using a multiple IAT administration approach

components of the present configuration. Such amendments might include increasing the number of trials in block 4 to the recommendations of Nosek and colleagues (Nosek et al., 2007), decreasing the number of trials in blocks 3 and 5, finding alternatives to the current category titles ‘Performance Goals’ and ‘Mastery Goals’, and continued pilot testing of stimuli words to assess their membership of the competence development and demonstration categories. In terms of implicit methods and achievement goals more generally, continued research should explore alternatives that are not just verbal, but visual and even situational in an attempt to improve ecological validity and better approximate the achievement situation.

Table 36. Aim 3b(i) summary

Aim	Findings	Future directions
-Developing an implicit method to access achievement goals and comparing it with an explicit achievement goal method (Aim 3bi)	-Self/Other Referent IAT and Valence IAT both internally consistent implicit achievement goal methods -Valence IAT greater internal consistency -No correlation between original IATs and Achievement Goal Questionnaire- <i>Revised</i>	-Continued fine-tuning of configuration and testing of achievement goal IATs -Explore potential for 2 x 2 IAT measurement -Comparison of implicit and explicit methods with behavior -Explore reasons for divergence (tapping single underlying construct or different constructs) -Design decisions for original achievement goal IATs potentially useful for other psychological constructs

8.1.3.2 Chapter Five: Study 2

Chapter 5 conducted the study suggested by the findings of the previous study, asking *will an implicit or explicit achievement goal method be more consistent with a student’s achievement behavior?* There was initially a struggle to find an achievement task that might adequately differentiate behaviorally between achievement goals. On one hand, most of the recent research linking

similar to that of Cvencek, Meltzoff, and Greenwald (2011), in which one IAT examined self and gender, another examined gender and math, and a last examined self and math.

achievement goals with behavior operates at the 2 x 2 achievement goal level, and the current study required comparison with the Valence IAT, which at present only operates at the dichotomous level. On the other hand, there was a struggle because of the often-varying correlational findings between achievement goals and behaviors, resulting from different assumptions underlying achievement goal operationalizations (i.e., whether performance goals should be operationalized in terms of demonstrating ability or outperforming others, Senko, Hulleman, & Harackiewicz, 2011). An induced failure anagrams task was selected, as it presented two behavioral persistence indicators that had been shown to correlate differently with performance and mastery goals (Sideridis & Kaplan, 2011). Collecting affect and intrinsic motivation ratings, which had also been shown to correlate differently with performance and mastery goals (Huang, 2011), provided further evidence of which of these goals participants had pursued. Both these behavioral and self-report indicators were then compared with either the Achievement Goal Questionnaire-*Revised* or the Valence IAT.

The findings suggested that while some participants indeed seemed to persist in line with either a mastery goal or a performance goal, these persistence differences were not accompanied by the theoretically predicted links with affect and intrinsic motivation. Furthermore, across two methods of analysis, the implicit and explicit methods were found to be consistent with behavior on the anagrams task for slightly less than half the time, but did not differ significantly in their consistency with the persistence behavior. The implication of this study is that neither method was especially effective at capturing the achievement goal enacted by the individual. As such, the answer to the research question was that both methods were equally consistent with the students' achievement behavior.

However, that the methods were only consistent with less than half the sample is of concern. While the Valence IAT is a new method and will require continued investigation of its predictive validity, the AGQ-*R* is a well-established tool. If it fails to significantly reflect students' achievement behavior, this is a problem for achievement goal research, and researchers must question what they have been measuring. In line with the argument made in

Chapter 3, one possibility is that achievement goal questionnaires only capture *post hoc* rationalizations of general achievement behavior, thereby only tapping into a more general *achievement narrative* (cf. Section 4.2.5), rather than illuminating achievement goals. Another possibility is that the paradigm used to assess achievement behavior in this study was problematic, for example in the way that participants' persistence behavior was categorized as representing performance or mastery goals using a median split. Future studies will need to explore this possibility by using different behavioral paradigms for which achievement goals are differential predictors. Some clearer examples could potentially be found in alternative paradigms for capturing persistence (Bouffard, Boisvert, Vezeau, & Larouche, 1995; Elliot, McGregor, & Gable, 1999; Pintrich et al., 1993), paradigms that focus on effort (Elliot et al., 1999), deep and surface learning strategies (Elliot et al., 1999; Entwistle, 1988), help-seeking (Ryan & Pintrich, 1997) or academic self-handicapping (Midgley & Urdan, 2001).

Table 37. Aim 3b(ii) summary

Aim	Findings	Future directions
-Conducting a comparison between achievement behavior and implicit and explicit achievement goal methods (Aim 3bii)	-Mastery persistence participants reported greater positive affect, interest and enjoyment, and importance and effort ratings (all non sig.) -Performance persistence participants reported greater perceived competence (sig.) and lower negative affect ratings (non sig.) -AGQ- <i>R</i> and Valence IAT similarly consistent (non sig.), combined consistency less than half the time (46%)	-Improve on achievement task and categorization approach used to operationalize achievement behavior as performance or mastery -Further study of Valence IAT and behavior -Further study of AGQ- <i>R</i> and behavior

8.1.3.3 Chapter Six: Study 3

Given that the priming procedure in Study 3 would provide groups across which persistence could be compared, the same task was used as in Study 2. Study 3 attempted to nonconsciously activate achievement goals and determine if

participants' achievement behavior, affect, and intrinsic motivation reflected the primed goal. This chapter specifically asked *is it possible to prime an achievement goal such that it is reflected in achievement behavior?* This study showed that priming performance and mastery goals indeed led to different persistence behaviors on an induced failure task. On average, those primed with mastery goals spent longer and made more attempts than those in a no prime control condition, followed by performance goal-primed participants. There were significant differences in persistence across groups in terms of average attempts made. For persistence in terms of average amount of time spent, the trend was in the right direction as suggested by significant differences across performance and mastery groups, indicating that performance goal-primed participants persisted less than mastery goal-primed participants. Importantly, none of the participants reported becoming suspicious of the influence of the priming task on the achievement task. Although tentative, this finding is promising, implying some very preliminary support for the possibility of nonconsciously operating achievement goals.

Given the aforementioned struggles with this particular achievement task, continued research using a different achievement task is recommended to replicate the priming effect, helping to build up a body of research on the possibility that nonconsciously activated achievement goals can influence achievement behavior. The eventual implication of such findings is that if it is possible to nonconsciously activate achievement goals within a laboratory setting, it may be possible that features of ordinary achievement settings also activate individuals' achievement goals, influencing their achievement behavior in ways that are *outside of their conscious awareness and capacity to comment*. Further research exploring this implication is warranted, and should also elucidate the extent to which implicit or self-report methods may be more pertinent in reflecting the achievement goals that operate in everyday achievement situations.

Another interesting finding from this study was the lack of predicted relationships between persistence behavior and affect and intrinsic motivation self-reports, with the resultant possibility that, while priming may be linked to non-self-reported methods, there may be a disjunction between these two

nonconscious elements and self-reports. More research on this finding is merited, as it, too, would imply that nonconsciously activated achievement goals do not emerge in self-report methods. Indeed, while the stories we tell ourselves about what motivates our achievement are undoubtedly important in guiding our conscious achievement behaviors, the majority of our everyday achievement behavior is unlikely to be consciously initiated and controlled, as argued in Chapter 3. As such, achievement goal researchers must continue to explore what cognitively unconscious achievement goal-driven behavior may look like.

Table 38. Aim 3b(iii) summary

Aim	Findings	Future directions
-Exploring if achievement goals can be nonconsciously activated (primed) and subsequently influence achievement behavior (Aim 3biii)	-Mastery goal primed participants persisted significantly more than performance goal primed participants -No sig. differences in affect and intrinsic motivation across conditions -No participants became aware of priming	-Replication with different achievement behavior task -Compare potentially linked non-self-report methods with self-report methods

8.1.3.4 Chapter Seven: Study 4

A preliminary attempt at exploring whether nonconscious methods would be inconsistent with self-report methods was made in the final study of the thesis, Study 4. This study specifically asked *does nonconscious activation of achievement goals lead to consistent responses on achievement goal methods?* The study used the AGQ-R and the Valence IAT as explicit and implicit achievement goal methods, respectively. In terms of consistency between the achievement goal priming conditions and the combined achievement goal methods, the findings indicated that the methods were consistent for the majority of the time (60%).

Furthermore, though the differences failed to reach significance, there was greater observed consistency for those primed with mastery goals and those who completed the Valence IAT than there was for those primed with performance goals and those who completed the AGQ-R. While this trend is in line with the suggestion that implicit methods may indeed be more likely than

explicit methods to capture an implicitly activated, and therefore nonconsciously operating, achievement goal, the fact that the study failed to reveal significant differences and appropriate mastery subscale and Valence IAT reliabilities requires that additional studies are done to explore this hypothesis further.

Continued research is also needed to understand why the mastery subscales and the Valence IAT demonstrated such low reliability, and understand if this resulted from the small sample size⁴⁵ or an as yet unknown influence of the achievement goal priming procedure on responses to achievement goal methods. Indeed, future studies should improve upon the limitations of the current study regarding small sample size and the lack of a neutral comparison group. The sample size of this study was particularly small due to a low take up in participants despite numerous recruitment attempts (a problem that persisted throughout the empirical studies in this thesis). A further limitation was the lack of a neutral control group, which might have aided in isolating whether it was the priming of achievement goals or just the specific sample that resulted in the low reliability of the AGQ-R and the Valence IAT.

Table 39. Aim 3b(iv) summary

Aim	Findings	Future directions
-Conducting a comparison between nonconscious activation and implicit and explicit achievement goal methods (Aim 3biv)	-AGQ-R and Valence IAT consistent for majority of time (60%) -Greater consistency for mastery-primed participants and Valence IAT than performance goal-primed participants and AGQ-R (all non. sig) -Low reliability on AGQ-R mastery subscales, Valence IAT - No participants became aware of priming	-Replication with larger sample size and added neutral priming condition -Continue to compare potentially linked non-self-report methods with self-report methods -Explore if priming achievement goals leads to interference with explicit and implicit achievement goal methods

⁴⁵ For example, due to high variation in the sample and greater measurement error (Nichols, 1999).

8.1.3.5 Summary

In summary, although affected by a range of limitations, the studies in this thesis constitute an important starting point in the nascent exploration of the nature and methodological implications of the possibility for nonconscious achievement goal pursuit. Given the vastness of the area of possible studies in this field, there remain other paradigms and methods that could have worked for which there was neither time nor resource to conduct. However, against a strong and persuasive background of research on the unconscious, the empirical studies in this thesis provide preliminary information regarding possibilities for investigating the potential for nonconscious achievement goals and throw up some promising areas for continued research.

8.2 Contributions to Knowledge

The contributions to knowledge made by the arguments and studies conducted in this thesis are both theoretical and methodological.

8.2.1 Theoretical Contributions

In terms of theory, this thesis has begun to explore the theoretical space opened up by achievement goal researchers who are beginning to acknowledge that research on the implicit may have implications for achievement goal theory (Pintrich, 2003; Murayama, Elliot, & Friedman, 2012). The thesis has argued in support of a connectionist cognitive representation of achievement goals, in which nodes form a network, parts of which are activated in different situations, and would represent achievement goals (Pintrich, 2000, p. 98). This representation is more dynamic than a schema-theoretic representation in that it draws from both the situation and the individual. As such the representation is a marriage of the dispositional and the context-specific, importantly allowing for intraindividual stability (Pintrich, 2000, see Section 2.1.5.2) and the accommodation of the multiple goal perspective (see Section 2.1.4.3), but also not requiring consciousness for the goal to operate. The thesis has also contributed to theoretical knowledge in marrying the findings of automaticity research with achievement goal theory, such that achievement goals, as cognitive representations and like other cognitive representations, should have the capacity to become activated and operate nonconsciously (Bargh, 1990).

Finally, the thesis has contributed to theoretical knowledge by suggesting, maybe somewhat controversially, that the implication of potentially nonconscious achievement goals is the limited validity of using predominantly self-report methods in achievement goal research (cf. Nisbett & Wilson, 1977; Wegner, 2002). This implication must be addressed in future theorizing, measurement, and interventions focusing on achievement goals with the aim of improving students' motivation and educational achievement.

8.2.2 Methodological Contributions

In terms of methodology, this thesis has contributed to knowledge in different ways. These contributions include the longitudinal nature of mapping the AGQ-R to the IATs, the first real attempt at priming achievement goals to explore if they can be nonconsciously activated to influence behavior like other behavioral and cognitive goals, and the comparison of a variety of goal methods – behavioral, self-reported, and implicit – within one study, which supersedes the current largely questionnaire-based corpus of achievement goal research.

The last methodological contribution made by this thesis is its design, development, and administration of two original, internally consistent achievement goal IATs. When the thesis was started, there were no achievement goal IATs, but in its duration the Like Me (Urdan & Cafasso, 2011) and IAT-T (Marzouq, Slade, & Carr, 2012) have been developed. As such, this thesis cannot claim to make the methodological contribution of the first or only achievement goal IAT. However, the Valence and Self/Other Referent IATs designed in this thesis are considerably different from the other achievement goal implicit methods, and at the same time, closer in procedure and configuration to the original IAT (Greenwald, McGhee, & Schwartz, 1998). Instead of using phrases that might affect the reaction times (Marzouq et al., 2012), these IATs use single words, with the potential for exploring more complicated achievement goal frameworks (i.e., 2 x 2, 3 x 2) in later, multiple IAT administration studies. Furthermore, instead of asking participants to decide how much a stimulus word is “like them” (Urdan & Cafasso, 2011), the IATs designed in this thesis are truly implicit in collecting reaction times based on associations rather than assessments of similarity to oneself. As such, while

assessments of similarity to oneself, like self-reports, might be internally consistent on a Like Me method, they are unlikely to tap the implicit. Thus the methodological contribution made by the two IATs in this thesis is that they are true to IAT procedure, internally consistent *and* tap the implicit.

The Valence and Self/Other Referent IATs designed in this thesis may undergo replications, further validation procedures, and possibly be used in future research elucidating why, how and in what situations achievement goal pursuit may be conscious at times and nonconscious at others. This process may be especially helpful considering Pintrich's (2003) point that nonconscious goal pursuit is reflective of "students learning in many classroom situations where they seem to proceed in rather habitual and unreflective ways" (p. 678). Furthermore, the description of considerations for adapting this implicit method may be useful for those studying other, similar social psychological constructs, for which the implications of the limits to self-report methodology that this thesis explores are likely to be equally relevant.

8.3 Conclusion

Having considered the findings of research on implicit cognition, the potential for cognitive representations of achievement goals to incorporate a nonconscious dimension, and the preliminary results of the empirical studies conducted within this thesis, the next step is to determine whether there are any changes that need to be made in defining and operationalizing achievement goals. Although the research within this thesis has thrown up some interesting areas for continued research, it is still too early to conclude that achievement goals can and do operate implicitly. However, given the growing evidence base for the cognitive unconscious, the strong implications of research on implicit cognition for the nonconscious activation and operation of goals in general (rather than achievement goals *per se*), in addition to the findings of the third study in this thesis, it is a distinct possibility that achievement goals, as cognitive representations, and potentially operating within a connectionist model, may also be activated and operate nonconsciously. From a methodological standpoint, the research on telling more than we can know and the illusion of the conscious will, in addition to the findings of the second and

fourth studies in this thesis, suggests that there is also a distinct possibility that self-report methods may be limited in what they can tell researchers about students' achievement goals. As such, the claim here is that using self-report methods as the sole method within achievement goal studies or as the predominant method within the field is distinctly limiting for a motivational construct as potentially powerful and influential in educational settings as achievement goals.

In terms, then, of concluding whether changes need to be made to how researchers define and operationalize achievement goals, there are two suggestions. The first suggestion is that researchers tentatively incorporate in their definitions of achievement goals the possibility for implicit achievement goals. This does not require a change to how a consciously pursued achievement goal, the only one at present, is defined, but requires the creation of a working definition of a similarly operating, albeit implicit, achievement goal. The development of this latter definition is fundamentally based on the second suggestion, which is that achievement goal researchers investigate the limitations of self-report methodology while further exploring the potential for nonconscious achievement goals. Studies exploring the utility of self-report measures of achievement goals should progress from predominantly correlational investigations to causal investigations (cf. Murayama, Elliot, & Friedman, 2012), and should involve comparisons with behavioral indicators and implicit methods. Studies exploring the potential for nonconscious achievement goals should include replications of the studies conducted within this thesis and follow its suggestions for future studies to clarify the current findings, in addition to exploring new approaches to asking these questions.

Ultimately, achievement goals have the potential to represent a powerful and influential motivational construct for learners and educational practice. Indeed, very early on, Nicholls (1978) suggested that the study of achievement goals might lessen current inequalities of motivational opportunity, arguing that “if we are committed to the fullest possible development of intellectual skills in all children we must accept individual differences in achievement, but we must also seek to maintain motivation in all children, not just the high achievers” (p. 811). The influence of an individual's motivation on their academic success and

subsequent life opportunities is vast; research on achievement goals could lead to interventions that one day aid those students with maladaptive motivational patterns to overcome these, and to reap the same learning and achievement benefits, in addition to a full range of accompanying mental, emotional, and social benefits, open to those of their peers who are more likely to seek help when in need, persist in the face of difficulty, take risks, and engage in challenging tasks.

However, at present, achievement goals as a construct are not meeting this potential. While some researchers have used the findings of achievement goal theory to develop in-school interventions to improve student motivation (e.g., Ames, 1990; Anderman & Young, 1994; Maehr & Midgley, 1996; Meece, 1991; Urdan & Midgley, 2003), Elliot and Murayama (2008) have suggested that the true potential of achievement goal research to cumulatively advance theory and enhance educational practice and student achievement is undermined by often unclear, and importantly, unmatched definitions and operationalizations (see also Senko, Hulleman, & Harackiewicz, 2011). As this thesis has suggested, further challenges have come in the form of suggestions about the limits of self-report and the potential for nonconscious achievement goals within a context of mounting evidence of an increasingly powerful cognitive unconscious. Supporting these theoretical suggestions, the empirical studies carried out in this thesis imply that achievement goals may at times operate nonconsciously to influence student achievement behavior, and that implicit methods may be helpful in studying nonconscious achievement goal pursuit. Continued research in this area has the potential not only to irreversibly transform how we conceive of and attempt to access achievement goals and a host of similar psychological constructs, but how we frame our pedagogy and student learning. In order for achievement goal theory to fulfil its powerful and influential potential to improve educators' practice and students' learning experiences, researchers must do their utmost to meaningfully address the issues presented in this thesis.

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10 Appendices

10.1 Study 1 Exploration of a Possible Method for Capturing Nonconscious Achievement Goals: Development, design and administration of 2 achievement goal IATs

10.1.1 Example Ethics Application and Approval (for Study 4)

10.1.1.1 Application

Durham University

School of Education

Research Ethics and Data Protection Monitoring Form

Research involving humans by all academic and related Staff and Students in the Department is subject to the standards set out in the Department Code of Practice on Research Ethics. The Sub-Committee will assess the research against the British Educational Research Association's *Revised Ethical Guidelines for Educational Research* (2004).

It is a requirement that prior to the commencement of all research that this form be completed and submitted to the Department's Research Ethics and Data Protection Sub-Committee. The Committee will be responsible for issuing certification that the research meets acceptable ethical standards and will, if necessary, require changes to the research methodology or reporting strategy.

A copy of the research proposal which details methods and reporting strategies must be attached and should be no longer than two typed A4 pages. In addition you should also attach any information and consent form (written in layperson's language) you plan to use. An example of a consent form is included at the end of the code of practice.

Please send the signed application form and proposal to the Secretary of the Ethics Advisory Committee (Sheena Smith, School of Education, tel. (0191) 334 8403, e-mail: Sheena.Smith@Durham.ac.uk). Returned applications must be either typed or word-processed and it would assist members if you could forward your form, once signed, to the Secretary as an e-mail attachment.

Name:

Laura da Costa

Course:

PhD Education

Contact e-mail address:

lauradacosta@gmail.com

Supervisor:

Dr Richard Remedios

Title of research project:

Do Self-Report and/or Implicit Achievement Goal Methods Capture Nonconsciously Primed Achievement Goals?

Questionnaire:

		YES	NO	
1.	Does your research involve living human subjects?	Y		IF NOT, GO TO DECLARATION AT END
2.	Does your research involve only the analysis of large, secondary and anonymised datasets?		N	IF YES, GO TO DECLARATION AT END
3a	Will you give your informants a written summary of your research and its uses?		N	If NO, please provide further details and go to 3b
3b	Will you give your informants a verbal summary of your research and its uses?	Y		If NO, please provide further details
3c	Will you ask your informants to sign a consent form?	Y		If NO, please provide further details
4.	Does your research involve covert surveillance (for example, participant observation)?		N	If YES, please provide further details.
5a	Will your information <i>automatically</i> be anonymised in your research?	Y (see further details)		If NO, please provide further details and go to 5b
5b	IF NO Will you explicitly give <i>all</i> your informants the right to remain anonymous?			If NO, why not?
6.	Will monitoring devices be used openly and only with the permission of informants?	Y		If NO, why not?
7.	Will your informants be provided with a summary of your research findings?	Y (option is given, if interested)		If NO, why not?
8.	Will your research be available to informants and the general public without restrictions placed by sponsoring authorities?	Y		If NO, please provide further details
9.	Have you considered the implications of your research intervention on your informants?	Y (see further details)		Please provide full details
10.	Are there any other ethical issues arising from your research?		N	If YES, please provide further details.

Further details

- 3a/b/c: Priming entails non-conscious activation of goals. Therefore, students will not have access to a full theoretical explanation of the research *before* they begin. I will be providing a written information sheet with the **consent form**, assuring participants of the confidentiality of their responses and that they may withdraw participation at any time during the task. Participants will be **debriefed in full** after the completion of the experiment. Participants will also have the option to provide their email address (on the consent form) if they would like further information, to be involved in future research, or to be kept updated with the progress of the research (and research findings).
- In relation to 5a, participants will be given a **participant ID** number, which I will have saved in a **password-protected Excel document**. The locked document will also be the site for storing the participants' emails, if these are provided (see above point). During the analyses, I will only be using the participant ID, and during reporting, there will be no way of identifying individual/specific participants.
- In relation to 6, no covert monitoring devices will be used. The Implicit Association Test (IAT) is a reaction time measure, and though participants are instructed to go as fast as possible, this measurement is not explicit. However, knowledge of what various measures of one's achievements goals suggest is unlikely to have as negative an impact on students as IATs measuring racial stereotypes, self-esteem, and gender bias.
- In response to item 9, I have considered the potential implications of completing the **Scrambled Sentences Task**, the **Achievement Goal Questionnaire** and the achievement goal **Implicit Association Test** on the participants. I have concluded that participants will not, as a result of participating in this research, be placed in a situation that will mentally, emotionally, or physically endanger them on any occasion during or after participation.

Continuation sheet YES/~~NO~~ (delete as applicable)**Declaration**

I have read the Department's Code of Practice on Research Ethics and believe that my research complies fully with its precepts. I will not deviate from the methodology or reporting strategy without further permission from the Department's Research Ethics Committee.

Signed: **Laura da Costa**Date: **24/02/2014**

SUBMISSIONS WITHOUT A COPY OF THE RESEARCH PROPOSAL WILL NOT BE CONSIDERED.

Research Proposal

Research has shown that goals can be activated nonconsciously (Aarts & Dijksterhuis, 2000; Bargh, Chen, & Burrows, 1996; Bargh et al., 2001; Bongers, Dijksterhuis, & Spears, 2009; Chartrand, 1999; Chartrand & Bargh, 1996; Chartrand & Bargh, 2002; Fitzsimons & Bargh, 2003), to influence an individual's behaviour, cognitions and affect. The current line of research examines whether the same applies to *achievement* goals, and works toward a better response to the question, *how should researchers measure students' goals for studying?*

Purpose

Building on the researcher's first three studies, the current study looks to again use priming to non-consciously activate participants' mastery or performance goals, and then use a self-report method, the Achievement Goal Questionnaire-*Revised* (AGQ-R, Elliot & Murayama, 2008) and an implicit method, the achievement goal Valence Implicit Association Test (Valence IAT, da Costa & Remedios, 2012) to provide some idea of which method, both, or neither, might represent a valid measure for capturing students' achievement goals. It should also shed further light on the potentially non-conscious nature of achievement goals.

Sample

The sample will comprise 60 university student volunteers. There will be equal numbers of participants per group (15 performance prime + AGQ, 15 performance prime + IAT; 15 mastery prime + AGQ, 15 mastery prime + IAT). A balance will be sought between postgraduates and undergraduates, and females and males.

Materials

The Scrambled Sentences task used here to prime achievement goals is adapted from Kawada, Oettingen, Gollwitzer, and Bargh (2004, experiment 2), and has previously been used to activate processing and behavioural goals (Chartrand & Bargh, 1996; Bargh et al., 2001) after its original use by Srull and Wyer (1979). For an example Scrambled Sentence Task, see Appendix A.

Elliot and Murayama's (2008) 12-item Achievement Goal Questionnaire-*Revised* (AGQ-R) will represent the explicit, self-report measure. The questionnaire comprises four subscales: performance approach, mastery approach, performance avoidance, and mastery avoidance. Participants will respond on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The AGQ-R is shown in Appendix B.

The Valence Implicit Association Test (Valence IAT, da Costa & Remedios, 2012) will be the implicit measure, with categories 'Good', 'Bad', 'Performance Goals', and 'Mastery Goals'. More details on the Valence IAT are shown in Appendix C.

Procedure (Ethics considerations in Bold)

All participants will be run individually, in a quiet room away from noise and distractions. **After filling out a consent form (see Appendix D),** participants will choose an envelope from a pile on the desk. In this way, the researcher will be blinded to the condition. The task instructions will ask

participants to unscramble 25 scrambled sentences, using four out of five of the available words to create coherent, complete sentences. The sentences presented to those in the performance goal conditions ($n = 30$) will contain 10 performance approach goal scrambled sentences. These will contain words related to the normative comparison criteria of performance goals, such as *win*, *compete*, *overtake*, *better*, and *best*, and will be interspersed with 15 neutral sentences (i.e., only using non-achievement-related words). The mastery goal experimental condition ($n = 30$) will operate similarly, with task- or self-based competence words, such as *understand*, *learn*, *improve*, *progress*, *competent*, and *persist*.

Participants will then be given either the AGQ-R or the Valence IAT. If the first participant does the AGQ-R, the next one will do the Valence IAT, the next will do the AGQ-R and so on.

Finally, the researcher will engage each participant in funnelled debriefing (see Appendix E) to gauge awareness of the real purpose of the Scrambled Sentence test. **The researcher will then explain the full purpose of the experiment, answer any questions, and remind participants that any information on how they did or more general findings is available to them if they wish.** Finally, the researcher will thank and dismiss them.

Analyses

Anonymity will be maintained during statistical testing. Priming condition and AGQ-R average score will be correlated, as will priming condition and IAT score, and comparisons made. Results will be sent to interested participants, and prepared for inclusion in PhD thesis and a publishable article.

10.1.1.2 Approval

SMITH J.C.





Actions ▾

To: DA-COSTA L.E.K.

Cc: REMEDIOS R.; ED-PGRSTUDENTS E.

Inbox

05 March 2014 09:23

- You replied on 05/03/2014 10:30.

Dear Laura

I am pleased to inform you that your application for ethical approval in respect of 'Do self-report and/or implicit achievement goal methods capture nonconsciously primed achievement goals?' has been approved by the School of Education Ethics Committee.

May we take this opportunity to wish you good luck with your research.

Sheena Smith
 Research Office
 School of Education
 Durham University

Tel: (0191) 334 8403
www.dur.ac.uk/education

10.1.2 Achievement Goal Questionnaire - *Revised*

Achievement Goal Questionnaire-Revised

Instructions: While filling out this questionnaire, please think about the goals you pursue in your classes at university in general. Then circle the number that best corresponds with the extent to which you pursue the specified goal.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. My aim is to perform well relative to other students.	1	2	3	4	5
2. My aim is to completely master the material presented in my classes.	1	2	3	4	5
3. My aim is to avoid learning less than I possibly could.	1	2	3	4	5
4. I am striving to avoid performing worse than others.	1	2	3	4	5
5. My goal is to learn as much as possible.	1	2	3	4	5
6. My goal is to avoid learning less than it is possible to learn.	1	2	3	4	5
7. I am striving to do well compared to other students.	1	2	3	4	5
8. My aim is to avoid doing worse than other students.	1	2	3	4	5
9. I am striving to understand the content of my classes as thoroughly as possible.	1	2	3	4	5
10. I am striving to avoid an incomplete understanding of the course material.	1	2	3	4	5
11. My aim is to avoid performing poorly compared to others.	1	2	3	4	5
12. My goal is to perform better than the other students.	1	2	3	4	5

10.1.3 Consent Form for AGQ-R



December 2011/January 2012

Dear Participant,

My name is Laura da Costa and I am a PhD student at the School of Education at Durham University. My research focuses on student motivation and I am interested in your views about your studies. My study involves you completing a questionnaire now and then doing a 10-15 minute task for me early next year.

If you are happy to take part in this phase of the study, please sign the consent form below. I do need your name so that I can assign you the appropriate task next year. Please be assured that any details you provide will be kept confidential, and you will remain anonymous throughout the analysis, write-up, and any publications that result from the work. In this way, no results will be linked back to you personally.

However, if you are interested in the final results of the work, please leave me an email address at the bottom of this sheet, and I will ensure you receive them.

Please feel free to ask me any questions, if you are still unsure about any aspect of the research or your role.

Thank you very much for your time in taking part,
Laura da Costa

I have read the above information sheet and I consent to taking part in this research

Name:

Signature:

Date:

Degree Programme:

If you would like further information, to be involved in future research, or to be kept updated with the progress of the research and its findings, please provide an email address on which I can contact you here:

10.1.4 Consent Form for IAT



January 2012

Dear Participant,

Recently, you completed a questionnaire for me, and agreed to complete a short task. If you are still happy to continue, please fill out the below. However, please be assured that any details you do provide me with will be kept confidential, and you will remain anonymous throughout the analysis, write-up, and any publications that result from the work. In this way, no results will be linked back to you personally. However, if you are interested in the final results of the work, please leave me an email address at the bottom of this sheet, and I will ensure you receive them.

Please feel free to ask me any questions, if you are still unsure about any aspect of the research or your role.

Thank you very much for your time in taking part,
Laura da Costa

I have read the above information sheet and I consent to taking part in this research experiment.

Name:

Signature:

Date:

Degree Programme:

If you would like further information, to be involved in future research, or to be kept updated with the progress of the research and its findings, please provide an email address on which I can contact you here:

10.1.5 Example Instruction Page of IAT (Valence)

Achievement Goal IAT

You will be presented with a set of words or images to classify into groups using the 'e' and 'i' keys on the keyboard. Classify items as quickly as you can while making as few mistakes as possible. Going too slow or making too many mistakes will result in an uninterpretable score. The following is a list of category labels and the items that belong to each of those categories.

Category	Items
Performance Goals	Win, Better, Best, Compete, Outperform, Overtake
Mastery Goals	Learn, Understand, Comprehend, Improve, Progress, Persist
Good	Joy, Love, Peace, Wonderful, Pleasure, Glorious
Bad	Awful, Agony, Terrible, Horrible, Nasty, Evil

Keep in mind

- * Two labels at the top will tell you which words or images go with each key.
- * Keep your index fingers on the 'e' and 'i' keys to enable rapid response.
- * Each word or image has a correct classification.
- * The test gives no results if you go slow -- Please try to go as fast as possible.
- * Expect to make a few mistakes because of going fast. That's OK.

I am ready to begin

Exit

Figure 20. Valence IAT instruction page

10.2 Study 2 Does achievement behavior indicative of mastery or performance goals correspond to implicit or explicit accounts?

10.2.1 Anagrams Answer Sheet

Anagrams

INSTRUCTIONS:

- Inside the folded cards in front of you are five anagrams.
 - Pick up card number 1 and work on the anagram.
 - When you have found the answer, or want to move onto the next one, close it again and put it aside.
 - Pick up the next card, working your way to the bottom of the pile.
 - Your solution for each anagram must use all of the provided letters. Solutions should be written below.
 - You can use the provided paper to do your working out. Use separate parts of the paper to work out each anagram.
-

Solutions

1.

2.

3.

4.

5.

10.2.2 Positive and Negative Affect Schedule (PANAS, Watson, Clark & Tellegen, 1988)

Post-Task Mood Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the anagram activity. Use the following scale to record your answers:

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

☐ Interested
☐ Distressed
☐ Excited
☐ Upset
☐ Strong
☐ Guilty
☐ Scared
☐ Hostile
☐ Enthusiastic
☐ Proud

☐ Irritable
☐ Alert
☐ Ashamed
☐ Inspired
☐ Nervous
☐ Determined
☐ Attentive
☐ Jittery
☐ Active
☐ Afraid

10.2.3 Intrinsic Motivation Inventory (IMI, Ryan, 1982)

Task Evaluation Questionnaire

For each of the following statements, please circle to indicate how true it is for you, using the following scale:

	1	2	3	4	5	6	7
	<i>not at all</i>			<i>somewhat</i>			<i>very true</i>
	<i>true</i>			<i>true</i>			
1. While I was doing this activity, I was thinking about how much I enjoyed it.	1	2	3	4	5	6	7
2. After working at this activity for awhile, I felt pretty competent.	1	2	3	4	5	6	7
3. It was important to me to do well at this task.	1	2	3	4	5	6	7
4. I thought this was a boring activity.	1	2	3	4	5	6	7
5. I didn't try very hard to do well at this activity.	1	2	3	4	5	6	7
6. I think I am pretty good at this activity.	1	2	3	4	5	6	7
7. I enjoyed doing this activity very much.	1	2	3	4	5	6	7
8. This was an activity that I couldn't do very well.	1	2	3	4	5	6	7
9. This activity was fun to do.	1	2	3	4	5	6	7
10. I was pretty skilled at this activity.	1	2	3	4	5	6	7
11. I tried very hard on this activity.	1	2	3	4	5	6	7
12. This activity did not hold my attention at all.	1	2	3	4	5	6	7
13. I am satisfied with my performance at this task.	1	2	3	4	5	6	7
14. I didn't put much energy into this.	1	2	3	4	5	6	7
15. I would describe this activity as very interesting.	1	2	3	4	5	6	7
16. I think I did pretty well at this activity, compared to other students.	1	2	3	4	5	6	7
17. I put a lot of effort into this.	1	2	3	4	5	6	7
18. I thought this activity was quite enjoyable.	1	2	3	4	5	6	7

10.2.4 Consent Form



October 2013

Dear Participant,

Thanks for coming in today!

My name is Laura da Costa and I am a PhD student at the School of Education at Durham University. As I will have mentioned, I mostly work on students' experiences while learning. Today I would like you to complete a series of tasks for me. The first is an anagrams task, followed by some questionnaires. I may also ask you to complete a computer-based categorization task. The entire process should take about an hour of your time.

If you are happy to take part, please sign the consent form below. Please be assured that any details you provide will be kept confidential and that your identity will remain anonymous throughout. Also, if at any stage you would like to withdraw, that is absolutely fine.

If you are interested in the results of this study, please leave me an email address at the bottom of this sheet, and I will ensure you receive them. Finally, please feel free to ask me any questions during or after today's session, if you are still unsure about any aspect of the research or your role.

Thank you in advance for your time,
Laura da Costa

I have read the above information sheet and I consent to taking part.

Name:

Signature:

Date:

Degree Programme:

If you would like further information, to be involved in future research, or to be kept updated with my progress, please provide an email address on which I can contact you here: _____.

10.2.5 Order of AGQ-*R* and Counterbalanced Valence IAT Allocation

Table 40. Participants (by number) allocated to each method

AGQ- <i>R</i>	Valence IAT (Performance Goal + Good First)	Valence IAT (Mastery Goal + Good First)
1, 2, 3, 8, 12, 16, 17, 21, 22, 25, 31, 32, 33, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50	4, 6, 9, 11, 13, 18, 19, 23, 26, 28, 30, 34, 36	5, 7, 10, 14, 15, 20, 24, 27, 29, 35, 37, 42

Note. AGQ-*R* = Achievement Goal Questionnaire-*Revised*, IAT = Implicit Association Test.

10.2.6 Alternative analysis of correspondence between behavior and achievement goal methods

A key analysis for this study involved determining whether what participants either said about their goals on the explicit method or showed via the implicit method matched their persistence behavior on the anagrams task. To assess this, a performance group was made up of all who had endorsed performance goals more strongly than mastery goals on the AGQ-R and those who had been faster to categorize performance and positive words when Performance Goals and Good were combined. The same was done for mastery. There were two AGQ-R respondents who emerged with equivalent performance and mastery subscale averages, so these participants were excluded from the analysis. Of the remaining 48 participants, 22 favored (AGQ-R or Valence IAT) performance goals whereas 26 favored mastery goals, revealing a 46-54% performance-mastery split in the sample. The mean persistence in terms of times and number of attempts on anagrams by performance and mastery group are shown in Table 41 and Table 42 below.

Table 41. Means and standard deviations of average amount of time on anagrams 1-3 by group

	AGQ-R_IAT Combined Group	<i>n</i>	<i>M</i>	<i>SD</i>
Avg Time on Anagrams 1-3	Performance	22	0:06:16	0:03:23
	Mastery	26	0:07:04	0:05:39
	Total	48	0:06:42	0:04:43

Note. AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Valence Implicit Association Test, *n* = number of participants per group, *M* = mean, *Min.* = minimum, *Max.* = maximum, *SD* = standard deviation.

Table 42. Means and standard deviations of average amount of attempts on anagrams 1-3 by group

	AGQ-R_IAT Combined Group	<i>n</i>	<i>M</i>	<i>SD</i>
Avg Attempts on Anagrams 1-3	Performance	22	10.11	7.68
	Mastery	26	10.28	10.46
	Total	48	10.20	9.20

Note. AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Valence Implicit Association Test, *n* = number of participants per group, *M* = mean, *Min.* = minimum, *Max.* = maximum, *SD* = standard deviation.

For both time spent on these anagrams and attempts made, the means differed as expected by group. In other words, participants for whom the implicit and

explicit methods suggested a favoring of performance goals spent about one minute less on average per anagram than those who had favored mastery goals. On average, those who had favored performance goals also made slightly fewer attempts on the anagrams than those who had favored mastery goals. However the differences between the performance and mastery means did not reach significance for either time spent or attempts made on anagrams 1-3.

10.2.6.1 Factorial ANOVA

Next, two 2 x 2 factorial ANOVAs were run. One attempted to determine the effect of type of achievement goal method and goal type on persistence in terms of average time on anagrams 1-3. The other attempted to do the same, albeit using average attempts on anagram 1-3 as the dependent variable. Both ANOVAs were conducted to assess if there were any differences by type of method (implicit or explicit) and whether performance or mastery was endorsed on the dependent variable of participants' persistence behavior. Table 43 below shows how many of the 48 participants belonged to each of the groups: AGQ-R or IAT condition, and performance or mastery goal endorsement.

Table 43. Number of participants by method and goal

	Performance	Mastery	Total
AGQ-R	11	12	23
Valence IAT	11	14	25
Total	22	26	48

Note. AGQ-R = Achievement Goal Questionnaire-Revised, IAT = Valence Implicit Association Test.

The first analysis of variance (ANOVA) failed to reveal a main effect of type of achievement goal method, $F(1, 44) = 2.946$, $MS_e = 79142.123$, $p = .093$, $\alpha = .05$, a main effect of goal type, $F(1, 44) = .464$, $p = .499$, and an interaction of achievement goal method and goal type, $F(1, 44) = .189$, $p = .666$. The second ANOVA, with a dependent variable of average attempts on anagrams 1-3 found a similar lack of main or interaction effects (type of achievement goal method, $F(1, 44) = 2.212$, $MS_e = 85.755$, $p = .144$, $\alpha = .05$; goal type, $F(1, 44) = .018$, $p = .895$; interaction of achievement goal method and goal type, $F(1, 44) = .066$, $p = .798$).

10.3 Study 3 Priming achievement goals? Successful nonconscious activation of achievement goals – behavioral evidence of nonconscious operation of achievement goals?

10.3.1 Performance Scrambled Sentence Task

Scrambled Sentence Task

INSTRUCTIONS: For each set of words below, make a grammatical four-word sentence and write it down in the space provided. Each item may have more than one solution, but please provide only one solution per sentence.

Example: flew eagle the plane around

Solution: The eagle flew around.

- | | |
|------------------------------------|------------------------------------|
| 1. a look takes they he | 13. we walk to have mushroom |
| 2. feeling win she pretty was | 14. to started he perform well |
| 3. sun morning drums the glittered | 15. cheered grant the loudly crowd |
| 4. to has compete he main | 16. felt Ben tired very entry |
| 5. money gave he four them | 17. class the she in best |
| 6. brown the yes window clean | 18. was ball thrown the table |
| 7. them better a than you're | 19. to wanted refuse hand he |
| 8. was unaware he kick completely | 20. the cut outperform tree down |
| 9. drink east needed she a | 21. mouse plot scroll the with |
| 10. a was fire victory there | 22. wheat best cultivate the they |
| 11. time now concrete is the | 23. ate too much he wings |
| 12. to she army overtake wanted | 24. buses year my topped I |
| | 25. water hold bottle the brown |

10.3.2 Mastery Scrambled Sentence Test

Scrambled Sentence Task

INSTRUCTIONS: For each set of words below, make a grammatical four word sentence and write it down in the space provided. Each item may have more than one solution, but please provide only one solution per sentence.

Example: flew eagle the plane around

Solution: The eagle flew around.

- | | |
|------------------------------------|---|
| 1. a look takes they he | 13. we walk to have mushroom |
| | 14. boat the learn rowed they |
| 2. fit comprehend trousers now the | 15. cheered grant the loudly crowd |
| 3. sun morning drums the glittered | 16. felt Ben tired very entry |
| 4. study in sit want the | 17. can improved cake be it |
| 5. money gave he four them | 18. was ball thrown the table |
| 6. brown the yes window clean | 19. to wanted refuse hand he |
| 7. master it dog's the lost | 20. progress long took programming the |
| 8. was unaware he kick completely | 21. mouse plot scroll the with |
| 9. drink east needed she a | 22. they with many persisted enthusiasm |
| 10. he time needed more effort | 23. ate too much he wings |
| 11. time now concrete is the | 24. sometimes moths must persevere you |
| 12. tried to understand he I | 25. water hold bottle the brown |

10.3.3 Neutral Scrambled Sentence Test

Scrambled Sentence Task

INSTRUCTIONS: For each set of words below, make a grammatical four word sentence and write it down in the space provided. Each item may have more than one solution, but please provide only one solution per sentence.

Example: flew eagle the plane around

Solution: The eagle flew around.

- | | |
|---------------------------------------|---|
| 1. a look takes they he | 14.the consequences accepted
were love |
| 2. wore she then jumper a | |
| 3. sun morning drums the
glittered | 15.cheered grant the loudly
crowd |
| 4. the on door was knock | 16.felt Ben tired very entry |
| 5. money gave he four them | 17.everything she think him told |
| 6. brown the yes window clean | 18.was ball thrown the table |
| 7. pouring main water the was | 19.to wanted refuse hand he |
| 8. was unaware he kick
completely | 20.defended they castle the joke |
| 9. drink east needed she a | 21.mouse plot scroll the with |
| 10. me it laugh to made | 22.they in steps unicorns
believed |
| 11.time now concrete is the | 23.ate too much he wings |
| 12.to decided I sleepy go | 24.match peppers the watch I |
| 13.we walk to have mushroom | 25.water hold bottle the brown |

10.3.4 Consent form



January 2013

Dear Participant,

Thanks for coming in today!

My name is Laura da Costa and I am a PhD student at the School of Education at Durham University. As I will have mentioned, I mostly work on students' experiences when they complete tasks. Today I would just like to run a couple of tasks and questionnaires with you to see if they might be useful in my future studies. It should not take more than half an hour of your time.

If you are happy to take part, please sign the consent form below. I do need your name so that I can assign you the appropriate task. Please be assured that any details you provide will be kept confidential and that your identity will remain anonymous. Also, if at any point you would like to withdraw, that is absolutely fine.

If you are interested in the final results of my future work, please leave me an email address at the bottom of this sheet, and I will ensure you receive them. Finally, please feel free to ask me any questions, if you are still unsure about any aspect of the research or your role.

Thank you in advance for your time,
Laura da Costa

I have read the above information sheet and I consent to taking part.

Name:

Signature:

Date:

Degree Programme:

If you would like further information, to be involved in future research, or to be kept updated with my progress, please provide an email address on which I can contact you here: _____.

10.3.5 Funnelled Debrief Procedure

Funnelled Questioning

1. What do you think the purpose of this experiment was?
2. Did you think that the tasks were related in any way? (If yes, in what way?)
3. Did anything you did on the first task affect what you answered on the questionnaire? (If yes, how exactly did it affect you?)
4. When you were completing the Scrambled Sentence Test did you notice anything unusual about the words?
5. Did you notice any particular pattern or theme to the words that were included on the scrambled sentence test?

10.4 Study 4 Which achievement goal method captures primed achievement goals?

10.4.1 Consent form



March 2014

Dear Participant,

Thanks for coming in today!

My name is Laura da Costa and I am a PhD student at the School of Education at Durham University. As I will have mentioned, I mostly work on students' experiences while learning. Today I would just like you to complete two quick tasks for me. The first will involve unscrambling some sentences, and the second will be either a learning questionnaire or a computerized sorting task. The entire process should take between ten to fifteen minutes of your time.

If you are happy to take part, please sign the consent form below. Please be assured that any details you provide will be kept confidential and that your identity will remain anonymous throughout. Also, if at any stage you would like to withdraw, that is absolutely fine.

If you are interested in the results of this study, please leave me an email address at the bottom of this sheet, and I will ensure you receive them. Finally, please feel free to ask me any questions, if you are still unsure about any aspect of the research or your role.

Thank you in advance for your time,
Laura da Costa

I have read the above information sheet and I consent to taking part.

Name:

Signature:

Date:

Age:

Degree Programme:

If you would like further information, to be involved in future research, or to be kept updated with my progress, please provide an email address on which I can contact you here: _____.

10.4.2 Funnelled Debriefing Procedure

1. What do you think the purpose of this experiment was?
2. What do you think this experiment was trying to study?
3. Did you think that any of the tasks you did were related in any way?
 - a. (If yes) In what way?
4. Did anything you did on one task affect what you did on the other task?
 - a. (If yes) How exactly did it affect you?
5. When you were completing the scrambled sentence task, did you notice anything unusual about the words?
6. Did you notice any particular pattern or theme to the words that were included in the scrambled sentence task?
7. What were you thinking of while working on the learning questionnaire/computerized sorting task? Did you have any particular difficulty or strategy?

10.4.3 Analysis of Reliabilities by Priming Condition

To explore whether the priming procedure may have impacted on the reliabilities of the two goal methods, such that being primed with a performance goal might elicit erratic responses on mastery subscale items, and *vice versa*, the sample was split according to priming condition and the correlations and alphas recalculated. Table 44 below lists the resultant reliability coefficients for the Valence IAT and the AGQ-R.

Table 44. Achievement goal method reliabilities when split by priming condition

Priming Condition	<i>n</i>	Pearson's <i>r</i> , Sig.	<i>n</i>	Cronbach's α			
		Valence IAT		PAP	PAV	MAP	MAV
Performance	7	$r = .47, p = .29$	9	.97	.97	.59	.13
Mastery	9	$r = .40, p = .28$	7	.71	-.92	-.04	.59

Note. *n* = number of participants per priming condition, IAT = Implicit Association Test, PAP = Performance Approach, PAV = Performance Avoidance, MAP = Mastery Approach, MAV = Mastery Avoidance.

In terms of the reliability of the Valence IAT by priming condition, the correlation failed to reach significance for both groups, implying an equal lack of reliability for both priming conditions. Splitting the sample by priming condition showed that the reliability of the performance subscales on the AGQ-R was considerably stronger for the performance goal primed participants than for the rest of the sample, while reliability on the mastery subscales was poor. For those in the mastery goal prime condition, the reliability of the performance approach subscale was the appropriate, followed by a slightly lower alpha for mastery avoidance, but the performance avoidance and mastery approach subscale alphas emerged as negative, indicating a negative average covariance among the items.

Nichols (1999) has suggested that negative alphas can occur as a result of item coding errors such as the researcher forgetting to reverse score items. The data were therefore checked for mistakes, but all items were coded and entered correctly. Given the extensive validation of the AGQ-R, in addition to the fact that the subscale alphas were acceptable in study 1, which had a similarly small sample size, Nichols's suggestion that the items may simply not have positive covariance is unlikely. Instead, the only remaining suggestion, "most likely with small sample sizes and small numbers of items, is that while the true population covariances among items are positive, sampling error has produced a negative average covariance in a given sample of cases" (Nichols, 1999, para. 2).

10.5 Authored article in Journal of Mixed Methods Research (da Costa & Remedios, 2014)

Different Methods, Different Results: Examining the implications of methodological divergence and implicit processes for achievement goal research

Laura da Costa¹ and Richard Remedios¹

¹ School of Education, University of Durham

Word count (exc. figures/tables): 9,887

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Abstract

Achievement goal theory is one of the most popular theories of achievement motivation. Techniques researchers have used to assess goals include standardized questionnaires and interviews. One curious finding is that participants whose self-report questionnaire responses strongly indicate they operate with a performance goal do not make performance goal responses in subsequent interviews. In this paper, we consider the nature of this divergence using a mixed methods approach and discuss how a third technique, the Implicit Association Test (IAT), might help address divergent goal responses. More broadly, we suggest that implicit measures may offer an additional and/or alternative technique for assessing the prevalence of psychological constructs thought to be underpinned by processes involving social cognition.

Keywords: Achievement motivation; Goal Theory; Implicit Association Tests; Self presentation; Social Cognition.

Different Methods, Different Results: Examining the implications of methodological divergence and implicit processes for achievement goal research

In recent years, Mixed Methods Research (MMR) has provided researchers with opportunities to explore how synergistic combinations of methods may offer the nuanced understandings necessary for meaningful study of complex phenomena (Teddlie & Tashakkori, 2010, p. 9). MMR studies are governed by the challenging of paradigmatic and methodological dualisms in favor of continua. Using methodological eclecticism and triangulation, carefully integrated research designs draw from both the qualitative and quantitative traditions, emphasise the best aspects of each method and minimise the impact of its limitations. Ultimately, using MMR can provide greater confidence in research findings.

However, while obtaining convergent results from different investigative methods seems to imply robust measurement of an underlying concept, the ontological implications of divergent results are often less clear. Through thorough re-examination of methods and conclusions via further study (Teddlie & Tashakkori, 2003, p. 17), divergence can indirectly lend empirical support for the revision of models and theoretical understandings of multi-faceted phenomena (Erzberger & Prein, 1997, p. 141). When divergence is encountered in fields where even a loosely designed mixed methods approach is applied, researchers must engage in this re-examination, confronting whether divergent findings spring from a lack of reliability and validity in one or more of the utilized methods, or if they are suggestive of a greater complexity inherent in the phenomenon under study. The divergence question remains unanswered in the study of achievement goals, a prominent theory within the literature on achievement motivation.

The past decade has seen achievement goal theorists discuss a variety of conceptual and methodological issues. One such issue has been the disparate conclusions derived from studies using questionnaires compared to studies using interviews. A present concern lies in accounting for, and addressing, the

divergence across achievement goal measures. This paper explores this issue utilizing the principle of divergence in MMR. Current achievement goal measures are re-examined and problematized by highlighting the potential consequences of using researcher-defined constructs in questionnaires and of demand characteristics in participant responses during interviews. The paper then considers the over-dependence on self-report in achievement goal research especially in light of research outlining the limitations of such self-reports. The final section offers a relatively unique, alternative method for assessing goal adoption, namely, the implicit association test (IAT, Greenwald, McGhee, & Schwartz, 1998). IATs purport to capture attitudes that are (wittingly or unwittingly) not reported by individuals. Typical examples of such attitudes are biases towards (and away from) racial groups, political parties, religious affiliations and body shape. IATs rely on reaction times to assess levels of congruence between associated stimuli; the longer the reaction time, the greater the level of incongruence. In this paper, we argue that the nature of achievement goals makes them ideal candidates for examination using IATs. IATs thus offer researchers a potentially powerful additional tool to address the divergence in findings across methods in current achievement goal research. Before focusing on the methodological issues, however, a brief introduction to goal theory is provided for readers new to the concept and constructs.

Achievement Motivation and Achievement Goals

Achievement motivation is the study of behavior in achievement settings, most commonly in educational contexts, although theories of achievement motivation can apply in any achievement-focused domain (e.g., business, medicine, and sports). Popular theories of achievement motivation include expectancy-value theory (Wigfield & Eccles, 2000), intrinsic motivation theory (Deci, 1975; Deci & Ryan, 1985), self-determination theory (Deci & Ryan, 1985), and interest theory (Renninger, Hidi, & Krapp, 1992). Achievement goal theory has developed alongside these theories, amassing over 1,000 (published) studies over the past 25 years (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010).

Though achievement situations are simultaneously social and academic, and students may consequently possess multiple goals, including social goals (Wentzel, 1989, 1991; Urdan & Maehr, 1995) and work avoidance goals (Nicholls, 1989), research on achievement goals (Nicholls, 1984; Diener & Dweck, 1978, 1980) focuses purely on the purposes for students' competence-related behaviors (Elliot, 2005, p. 53). Goal theory started as a simple dichotomy between goals that were characterized as mastery (the desire to understand material) or performance (the desire to show ability to others) (e.g., Diener & Dweck, 1978, 1980). A trichotomous model followed, adding an avoidance valence to performance goals, such that performance avoidance was characterised by a desire not to perform poorly (see Elliot & Harackiewicz, 1996). In 2001, a full two-by-two model was proposed that included mastery-avoidance (a desire to avoid missing opportunities to learn) (Elliot & McGregor, 2001). Most recently, a 3 x 2 model (Elliot, Murayama, & Pekrun, 2011) has been proposed, emphasizing differences between task-, self-, and other-based standards and more carefully aligning achievement goal constructs with the theorized core of competence.

Despite the progression of theoretical models, the meaning of 'goal' often remains implied and inexplicit in research. This leads not only to diverse operationalizations and conclusions about findings but also to difficulty in obtaining a consistent body of results that translates into practical recommendations (Elliot & Murayama, 2008, p. 613). Clearer definitions can stem from reactions to how goals are operationalized in studies. For example, when Urdan and Mestas (2006) interviewed students about the reasons behind their goals, and suggested that different reasons behind goals may lead to different achievement outcomes, Elliot (2005, p. 65) argued that while both were valuable, goals, understood as aims, and the underlying reasons for these aims, are to be held as conceptually distinct. Disagreements have also occurred over whether students' achievement goals are state-like and context-dependent or trait-like and akin to personal dispositions, and the implications of this for interventions. This definitional difficulty is in part due to a lack of explicit discussion regarding *how* goals are mentally represented (Pintrich, 2000, p. 96). In this paper, achievement goals are believed to be cognitively represented

in a connectionist-type model (Pintrich, 2000; Smith, 1998), where purposes are nodes, linked within a network to other nodes, together representing an individual's "definition of success, role of effort and errors, and standards" (Pintrich, 2000, p. 98). In achievement settings, paths between these nodes are activated in different ways based on how they interact with factors in the individual's surrounding environment. Paths that are often activated in the same way may be strengthened over time and therefore more readily activated, producing a sort of intraindividual stability (Pintrich, 2000, p. 99) between, for example, success defined as obtaining good grades, effort considered as a necessary aspect of doing well, errors understood as learning experiences, and the task and one's previous performance held as the standards for judging one's success. This goal conceptualization has several implications. Goals are dependent both on contextual influences and internal representations; studying them requires examining how they are activated and which patterns of activation are strongest; and an individual's awareness of the path of activation is not required for it to impact on their thoughts and behaviors (Pintrich, 2000, p. 98).

Experimental and Questionnaire Methods

Over the last three decades, achievement goal theorists have examined if differences in achievement can be explained by students' mastery or performance goal pursuit. In early think aloud research conducted by Dweck (Diener & Dweck, 1978), mastery responses to failure on tasks were largely understood as adaptive because students attributed their failure to effort, maintained positive affect and expectations for success, persisted in the face of challenge, and were able to retain good performance even after failure. In contrast, students with performance responses displayed helpless, maladaptive behavior, negative affect, diminished expectations of success, lowered performance, ability attributions, lack of persistence, and also chose tasks that were either too difficult or too easy.

Researchers have since employed experiments and questionnaires, and later interviews, to investigate students' goals. In experiments, goals have been assigned to participants randomly and induced using task descriptions and

instructions that allude to normative evaluations or learning aspects.

Experimental manipulations have explored achievement goals as differential predictors of performance (Butler, 1987), students' choice of tasks, performance in the face of difficulty, attributions, and expressions of affect (Elliott & Dweck, 1988), use of effective learning strategies (Stipek & Kowalski, 1989), levels of information processing (Graham & Golan, 1991), and intrinsic motivation (Elliot & Harackiewicz, 1996). Theoretically allowing for the measurement instead of manipulation of achievement goals (Elliot & Church, 1997, p. 219), questionnaires have also been used in an attempt to correlate reported achievement goal orientations with achievement-relevant outcomes, such as performance approach goals with academic attainment (Elliot & Church, 1997), mastery goals with adaptive help-seeking behaviors (Ryan & Pintrich, 1997), mastery goals with interest (Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997), performance avoidance goals with academic self-handicapping (Midgley & Urdan, 2001) and mastery goals with self-regulation (Middleton & Midgley, 1997). On the whole, findings from questionnaires have tended to agree with those of experimental manipulations, as, for example, in Elliot and Church's (1997) precursor to the Achievement Goal Questionnaire, where positive relationships were observed between mastery goals and intrinsic motivation and performance goals and graded performance.

Problems with Experimental and Questionnaire Methods

Though experimental manipulations and self-report studies of achievement goals often produce similar results, there remain problems with the implications of their findings for causal models involving goals and outcomes. In addition to the often acknowledged difficulty of obtaining ecological validity in experimental manipulations, there is potential difficulty in ensuring that participants have truly pursued the goal that the researchers intended to induce, and that this has subsequently led to differentiated achievement-related outcomes by goal. Contributing to this problem are issues with task instructions that are meant to activate only the desired goal but may activate another goal simultaneously. An example of this occurs in Elliot and Harackiewicz (1996) with the supposedly performance approach description of

the task “this session will give you the opportunity to demonstrate that you are a good puzzle solver” (p. 464) and the performance avoidance description “this session will give you the opportunity to demonstrate that you are not a poor puzzle solver” (p. 464), where the emphasis may have shifted from normative comparison to solely “trying to do well” (Brophy, 2005, p. 170), which is traditionally regarded as mastery. A further issue regarding causality in the goal-outcome relationship lies in the use of questionnaires. Here, levels of past performance (e.g., on exam scores) may impact on students’ reports of performance approach goal pursuit, instead of the pursuit of performance approach goals leading to high performance, in much the same way that endorsing such goals would be unrealistic for those with histories of lower attainment (van Yperen, 2003; Brophy, 2005). Therefore, despite the similarity of results for these methods, which may be perceived by some as a strength of achievement goal research, it is clear that more research is required to better elucidate the nature of the causal, rather than purely correlational, relationships between goals and performance.

Additional problems with using questionnaires have been highlighted by an interesting methodological debate that has arisen around the construct labelled the performance approach goal. Researchers have suggested that the goal of “comparing oneself to others” has been either over-emphasised (Brophy, 2005), or that it under-emphasises many other goals that pupils seem to have (Lemos, 1996; Urdan, 2004a, 2004b; Urdan & Turner, 2005; Urdan & Mestas, 2006). One key criticism has surrounded the usefulness of questionnaires commonly used to assess goal adoption (e.g., Achievement Goal Questionnaire, AGQ-Revised, Elliot & Murayama, 2008; Patterns of Adaptive Learning Scales, PALS, Midgley et al., 2000). For example, Urdan and Mestas (2006, p. 355) suggested that questionnaires pose a danger of overestimating how often mastery and performance goals occur spontaneously in classroom settings. When faced with a questionnaire with Likert-scale response categories, they suggest, participants are not mentioning achievement goals spontaneously or in their own words, and their endorsement of achievement goals may be due to a ‘now-that-you-mention-it’ effect (Urdan & Mestas, 2006, p. 354). In addition, questionnaire statements that reflect important theoretical

distinctions can be interpreted by respondents in ways that do not match the researchers' intentions. With no follow-up questions to verify understanding, students' incomprehension and achievement goals may be masked (Urduan & Mestas, 2006, p. 362; see also Ciani & Sheldon, 2010). The consequences of using questionnaires are that participants are only able to agree or disagree to differing extents with the available items. They cannot ask for clarification or indicate if they agree more with part of the statement than the whole. So even if questionnaires are claimed to measure rather than manipulate students' goals, formats that only provide the options to agree or disagree with what will be understood by researchers as performance-approach, performance-avoidance, mastery-approach, and mastery-avoidance items give the impression that students themselves actually *do* pursue these goals and *only* these goals (Brophy, 2005, p. 168).

Using interviews in achievement goal research

Such problems with experimental and questionnaire methods have led to the exploration by some of using interviews to access learners' achievement goals (Lemos, 1996; Brophy, 2005; Urduan & Mestas, 2006). To avoid researcher-defined operationalizations of goals, advocates of interviews suggest investigating the meanings students themselves give to achievement goals (Urduan & Mestas, 2006, p. 364) in more naturalistic and non-laboratory classroom conditions (Lemos, 1996, p. 154). What is most interesting in terms of goal theory is that when researchers have used interviews to examine goals, differences between theory and responses have emerged. For example, Urduan and Mestas (2006) asked participants to complete the PALS and then interviewed them. Focusing on participants who rated performance avoidance items highly, Urduan and Mestas found that students repeatedly provided *approach* reasons to explain their endorsements of *avoidance* items (Urduan & Mestas, 2006, p. 363). This mismatch between what the item was supposed to be measuring and what students thought the item meant suggested participants' difficulty understanding the avoidance form of the goal. Brophy (2005, p. 171) has also pointed out the infrequency of students' spontaneous mentions of performance goals in interview research (i.e., Lemos, 1996; Urduan,

2001; Urdan, Kneisel, & Mason, 1999). For example, when Lemos (1996) asked Portuguese sixth graders open-ended “what for” questions (e.g., “What do you want?”, “What are you trying to accomplish?”), she found that the goals students reported related to achievement *per se* included working goals (e.g., “to finish it and to go on to the next one”, “to get it done”), evaluation goals (e.g., “desire to be positively evaluated and/or...avoid negative evaluations concerning academic classifications”), learning goals (e.g., “to know more about”, “to find out how”), and enjoyment goals (e.g., “activities in which they engaged for pleasure, enjoyment, and fun”). Even in the goal most similar to the aforementioned characterization of performance goals, the evaluation goal, students only mentioned succeeding in terms of grades, rather than being seen to do well or better than one’s peers (Brophy, 2005, p. 171).

In short, when probed in different ways, students seem to suggest a whole range of goals. Although Senko, Hulleman and Harackiewicz (2011) provide evidence that students do spontaneously report performance goals more frequently than reported by Brophy and colleagues (see Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Levy, Kaplan, & Patrick, 2004; Urdan, 2004a; Job, Langens, & Brandstätter, 2009), it is clear that in some research, participants do not make any mention of performance goals.

Despite clear evidence from questionnaire-based research that students adopt performance goals, interview-based studies suggest either that they do not, or at least that the prevalence of performance goals is considerably overstated. Such equivocal findings pose a critical divergence in the study of achievement goals: which method is capturing the construct? Both, neither, or only one of them? Moreover, how can researchers even assess which method might be more effective?

What is particularly striking from research conducted using interviews is how convinced participants are about their goals. In fact, no study has reported participants saying, “I’m sorry, I really do not know what my goals are” nor, when asked about items that they have rated on an achievement goal questionnaire, have participants replied, “I don’t know why I said that”. Clearly participants were confident they knew what goals they were pursuing. One self-

evident truth assumed from the questionnaire-based studies is that participants were reporting accurately on the reasons for their achievement behaviors. On the face of it, the claim seems entirely reasonable; individuals know the reasons why they behave. However, a large body of research suggests differently.

Limited Introspective Accessibility

As early as the 1970's, questions were raised about whether social psychologists were justified in asking participants about the reasons for their behavior, choices, and evaluations (for a review, see Nisbett & Wilson, 1977). Cognitive psychologists Mandler (1975), Miller (1962), and Neisser (1967) controversially proposed that "we may have no direct access to higher order mental processes such as those involved in evaluation, judgment, problem solving, and the initiation of behavior" (Nisbett & Wilson, 1977, p. 232). While this claim stemmed from work on the relatively automatic processes underpinning perception and memory, more research was required to justify generalizing such claims to social psychology, where much self-report research depended (and still does) upon the assumption of introspective access. Reviewing work on cognitive dissonance, attribution, subliminal perception and complex judgment tasks, Nisbett and Wilson's (1977, p. 233) seminal research on self-reports argued there was indeed evidence that people were often unable to accurately account for factors that were impacting on their responses.

For example, in one study carried out by the authors, participants were provided with a list of word pairs to memorize. Interested in whether participants were aware of influences on their associative behaviors, the researchers provided some participants with pairs that were meant to activate associations with desired words that could then be elicited in participants' responses during a later word association task (Nisbett & Wilson, 1977, p. 243). The critical word pairs participants were asked to memorize in the first task contained words such as "ocean" and "moon". In the subsequent standard word association exercise, in which the experimenters provided participants with probe words (i.e., "Detergent") and asked the participants to utter the first word that came to their minds, they found that words they had intentionally

semantically cued (target words, i.e., “Tide”) were twice as likely to be uttered by the participants who had been exposed to the critical word pairs. When asked about what influenced their responses, participants provided reasons such as “My mother uses Tide”, or “I like the Tide box” (Nisbett & Wilson, 1977, p. 243), with only a third of participants, when directly asked, ceding that the word pairing memorization may have been a possible influence. Nisbett and Wilson found similar instances in a wide range of social psychological research, including their own work examining positioning effects and reported reasons for product appraisal (Nisbett & Wilson, 1977), and Latané and Darley’s (1970) classic bystander effect. Nisbett and Wilson concluded from such studies that participants’ self-reports were *often inaccurate* in three different ways. Participants were strikingly unable to report accurately that an influential stimulus existed (i.e., Nisbett & Schachter, 1966), that they were responding to this stimulus (i.e., Valins & Ray, 1967), or that these processes were even occurring (i.e., Bem & McConnell, 1970).

The consistent inaccuracy of participants’ self-reports led Nisbett and Wilson to question where participants were actually drawing self-reports from, if not from direct introspection. One answer came in the form of Tversky and Kahneman’s (1974) representativeness heuristic, by which “a particular stimulus will be deemed a representative cause if the stimulus and response are linked via a rule, an implicit theory, a presumed empirical covariation or overlapping connotative networks” (in Nisbett & Wilson, 1977, p. 249). In other words, the often inaccurate reports implied that participants’ (strongly held) beliefs were not the product of awareness or memory of some internal process, but *a priori* theories linking stimuli and responses (Nisbett & Wilson, 1977, p. 233). Participants were assessing a situation and (subconsciously) reporting what might be a plausible reason for their behavior. Support for this reasoning came from studies in which observers not participating in a situation were asked to explain reasons for the behavior of those actually participating. The studies showed that the observers’ predictions were identical to reports provided by participants, who were assumed to possess some introspective access that could be called upon in their self-reports (Nisbett & Bellows, 1976).

Not only is there considerable evidence that individuals are poor at (accurately) reporting reasons for their behavior, there is actually a very good reason. As human beings, we have built up a store of experience of causal connections between events and when asked to report the reason for our own behavior, we use that experience. So in the study by Latané and Darley (1970), in which a greater number of bystanders reduced one's own likelihood of helping in an emergency, why would participants say "the reason I didn't help was because there were so many other people around?" when much more plausible and personally defensible reasons such as "I was too busy" were available? Translating the evidence from studies reported by Nisbett and Wilson (1977), when asked about their goals, learners (quite reasonably) base their goal self-reports on *post hoc* rationalizations of their achievement behavior, rather than direct introspection and accessing of the goals that directed it.

Implications for Achievement Goal Research and the Reply from Goal Theorists

In this paper, we have used Nisbett and Wilson's (1977) comprehensive review as an invaluable source of examples. The evidence that supports claims of poor introspective access is actually vast and varied (e.g., Bargh & Chartrand, 1999; Gazzaniga, 2000; Gopnik, 1993; Kihlstrom, 1987; Wegner, 2002). More importantly for this paper, the findings have compelling implications for the large amount of achievement goal research that has been conducted using interviews: learners may actually be unable to access and thus report accurately on *why* they have followed certain goals, whether they *have* pursued certain goals, or that they have even *pursued goals* in the first place. When asked, participants may simply put forth plausible, implicit theories about what directs their achievement behavior. These theories and self-reports may be informed by the frictions extant between certain positions or behaviors (e.g., not helping when a greater number of others are present; wanting to do better than others) and an individual's concerns about how this reflects on them (e.g., an unethical human being; being overly competitive), thereby supporting the earlier critique of achievement goal interviews wherein demand characteristics and social desirability were provided as possible explanations for respondents' reluctance to spontaneously endorse performance goals.

Crucially, for the implications of Nisbett and Wilson's findings on limited introspection and ability to accurately self-report to apply to achievement goal research requires that goals share the same cognitive characteristics as the inaccessible higher mental processes Nisbett and Wilson discuss. In addition to the theorized cognitive representation of achievement goals provided earlier, this question can be considered in light of the attention it has received within motivation research (Murphy & Alexander, 2000), and in the achievement goal literature more specifically (Elliot & Fryer, 2008; Lemos, 1996; Pintrich, 2000).

Murphy and Alexander (2000) conducted a review of motivation terminology from a useful outsider's perspective, and discussed the issue of accessibility. Trying to understand why there were fewer motivation studies of younger children, they suggested that younger individuals may lack the ability to reflect and articulate such concepts when asked (Murphy & Alexander, 2000, p. 32). Given Nisbett and Wilson's (1977) work, this logically applies not only to younger children, but to all who are asked to report on their achievement goals. Murphy and Alexander (2000) also observed that the fundamental assumption made by motivation researchers, *that their respondents can accurately self-report*, was challenged philosophically by James (1890), who argued that most of our daily experiences and behaviors are set in motion unconsciously and that as a result, we can only know a limited amount about ourselves at any one moment (in Murphy & Alexander, 2000, p. 37). Ostensibly as a result of this assumption, Murphy and Alexander's (2000) review of the motivation literature did not reveal much explicit discussion of accessibility. Instead, they often found the phrases learners' "beliefs" or "perceptions" (Murphy & Alexander, 2000, p. 38) accompanying self-reports, and took these to represent motivation researchers' acknowledgement that human access to motivational mechanisms is limited (Murphy & Alexander, 2000, p. 39).

Pintrich's (2000) direct reply addressed the issue of accessibility from an achievement goal perspective. By distancing goals from unconscious constructs such as motives or needs, Pintrich suggested that Murphy and Alexander's

(2000, p. 37) questions regarding the accessibility of motivation were therefore irrelevant to the valid operationalization of goals (Pintrich, 2000, p. 96).

However, Nisbett & Wilson (1977) only use 'motive state' in line with developments in motivation research up until the time of writing, and Murphy and Alexander (2000) use it because their review is not only limited to achievement goal research; the concerns, therefore, remain. Despite this, Pintrich (2000, p. 96) and others (e.g., Lemos, 1996, p. 151; see also Elliot & Fryer, 2008) see goal theory as stemming from the cognitive revolution, with its associated assumptions. Goals are assumed to be cognitively represented in ways that are consciously accessible, accounting for Murphy and Alexander's (2000) limited findings of its explicit discussion.

Elliot and Fryer (2008) argue that a significant aspect of the definition of goals is that they are consciously committed to, and that such commitment begins with conscious intention. However, they simultaneously refer to research conducted by Bargh and his colleagues (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001) on automatic processing, ceding that "once in place in the cognitive system, goals may be activated and may operate in a thoroughly automatic, nonconscious fashion" (Elliot & Fryer, 2008, p. 246). This claim is made without discussion of its implications. When and how often, for example, must such goals be consciously committed to, become part of the cognitive system, and then operate automatically? Is it every time that a new task is provided in an achievement setting or can goals that have previously been activated for similar tasks become automatically activated given similar environmental conditions? Can learners access these automatic, nonconscious goals, and report on their activation and adoption within everyday achievement settings? Acknowledging research findings on automaticity is interesting not only given the implications of Bargh's findings for the continued use of self-report measures in achievement goal research, but considerably more so in terms of the centrality of especially Elliot in producing achievement goal self-report measures, coupled with the sustained absence of automaticity from the definition of achievement goals.

Despite a wealth of findings implying the limitations of introspective accessibility, there remains a reluctance to engage with its implications for using self-reports in measuring social psychological constructs. At least for achievement goals, this can be argued to result from assumptions linked to the origins of achievement goal theory in the cognitive revolution.

The Automaticity of Goal Setting

However, the cognitive revolution also resulted in work that strongly challenges goal theory assumptions. Crucially, this includes research by Bargh and his colleagues on the interactions between conscious and automatic mental processes. Acts of the former are characterized by awareness, intention, effort, and control (Bargh & Chartrand, 1999, p. 463), and would seem to describe how Pintrich (2000), Lemos (1996), and the studies that Murphy and Alexander (2000) reviewed conceptualize goals. Automatic mental processes, which interest Bargh, and which Elliot and Fryer (2008) acknowledge, have not yet met the same definitional consensus within the literature. One conceptualization involves processes that are originally consciously intended and goal-driven, such as wanting to learn how to ride a bicycle, which become more efficient and automatic over time and through practice (Bargh & Chartrand, 1999, p. 463), while another is characterized by the effortless, unintended, and unaware perception and analysis of environmental factors (Bargh & Chartrand, 1999, p. 463-464).

Both conceptualizations of *automatic* mental processes revolve around the concept of “limited conscious attentional capacity” (Bargh & Chartrand, 1999, p. 464). Baumeister, Tice and colleagues (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven, Tice, & Baumeister, 1998) have investigated the detrimental effects on performing a second, minor self-regulatory act (e.g., avoid laughing while watching a funny movie) in an unrelated activity after participants have been asked to perform a first, also minor self-regulatory act (e.g., do not think about white bears). The limits to conscious attentional capacity that they have observed have led them to suggest that because even small conscious self-regulatory acts use this capacity, as little as 5% of our daily acts of self-regulation can occur consciously (in Bargh & Chartrand, 1999, p.

464). Thus the remainder – the majority – of our mental processing occurs on a nonconscious, automatic level. While it could be argued that achievement goals would make good candidates for this 5%, the highly similar nature of many academic tasks would suggest the greater likelihood that conscious goal decisions are made in the presence of novel or extraordinarily challenging academic tasks, and are absent from the everyday achievement settings that achievement goal researchers are generally interested in measuring using self-reports.

According to Bargh and Chartrand (1999), when a specific situation is presented to the learner, a conscious choice is made regarding response to that situational stimulus, a goal or purpose is decided, and then acted upon. With time, the repeated presentation of this situation or situations with similar features results in a bypassing *through automatization* of the conscious choice, such that the effortless, unintentional, and unaware perception of the situation activates the goal, its operation, and its fulfilment. This process, which can be *intentionally* or *unintentionally* acquired, is illustrated in Figure 1. Importantly, this raises similar questions to those surrounding Elliot and Fryer's (2008) definition, especially in terms of when that conscious choice is made, whether students can comment on if it was consciously made, and in line with the model this paper proposes for the nature of the cognitive representation of achievement goals, how these paths of activation among relevant nodes are strengthened and readily activated over time.

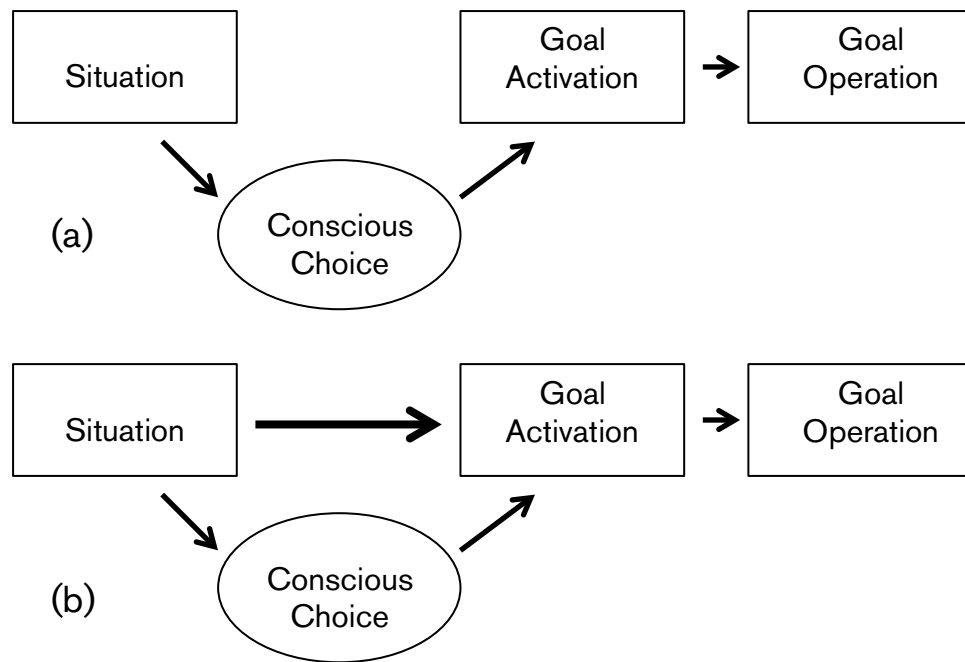


Figure 1: (a) Conscious, Intentional Mediation of Goal Pursuit within a Situation and (b) Automatic Activation and Operation of Goals by Situational Features Following Repeated Choice of the Same Goal (Bargh & Chartrand, 1999, p. 470)

Using priming procedures, Bargh and his colleagues have been able to empirically examine this perception-to-action logic for the automatic, that is, the unintentional, effortless, and nonconscious, activation of both cognitive and behavioral goals. In an experiment examining *cognitive* goals, Chartrand and Bargh (1996) found that unobtrusively exposing, or priming, participants to synonyms of either the word ‘memorization’ or ‘evaluation’ in an unrelated first activity led them to adopt these concepts as goals for dealing with a set of unrelated information presented to them later on. In other words, participants were unaware that they possessed these goals, which had been activated by triggers in their environment (i.e., the primes) and yet acted on them. This replicated, albeit with implicit primes, the results of Hamilton, Katz and Leirer (1980), where participants *explicitly* asked to follow an impression-formation goal not only remembered more of the material but also gave evidence of having better organized the information in their memory than those instructed to memorize the material (Bargh & Chartrand, 1999, p. 469).

Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel (2001, experiment 4) examined the automatic activation of *behavioral* goals by priming the goal 'to achieve' in some participants and not others. They found that when participants were asked, via intercom, to stop working on an activity in which they were given two minutes to find and note down as many words as they could using a set of Scrabble tiles, 57% of those who had been primed with the achievement goal, as opposed to only 22% of the control group, continued working so as to obtain a higher score.

These experiments suggest that goals can become automatized processes to limit cognitive overload, and can guide cognitive and behavioral responses. Even unwitting perception of specific environmental factors can trigger goal adoption, with the same emotional and behavioral effects as intentional, consciously set goals. Indeed, Chartrand (1999) has shown that inducing success and failure affects mood and self-efficacy beliefs even for participants unknowingly primed with the goal 'to achieve'. Because the process of automatization itself is automatic, and often not intended, goals may become automatic and activated in situations without our conscious awareness that this has occurred (Bargh & Chartrand, 1999, p. 469), affecting our ability to comment on them. Just as in Nisbett and Wilson's (1977) work, in each experiment, Bargh and his colleagues probed participants after they had outwardly pursued the implicitly primed goals, as indicated by the researchers' dependent measures, and found them entirely unaware of having done so (Gollwitzer & Bargh, 2005, p. 633). These studies directly challenge achievement goals theorists' assumptions that goals are conscious and accessible. When such research is placed alongside common achievement goal measures that rely entirely on these assumptions, goal theorists must begin to acknowledge the implications conceptually and methodologically.

Implicit Association Tests and Achievement Goal Research

So far we have outlined the dilemma for researchers trying to capture achievement goals and have suggested that these goals may be part of a system that is more unconscious than conscious. What is less clear is how researchers

could ever test this claim. Is it possible to access performance goals using a method other than interviews or questionnaires?

In the past, motivation researchers used a nonconscious measure, the Thematic Apperception Test (TAT, McClelland, Atkinson, Clark, & Lowell, 1953), to measure achievement motives, today seen as antecedents to more concrete achievement goals (Elliot & Church, 1997). The TAT, a projective test first developed by Morgan and Murray (1935), involves presenting participants with ambiguous picture cards and asking them to tell stories about these pictures. Participants' descriptive stories about the pictures are thought to reveal details of their current conscious or unconscious states. Implicit motives (McClelland, Koestner, & Weinberger, 1989) were theorized to be inaccessible to self-report, and as such the construct presented a candidate for exploration using the TAT (e.g., McClelland & Liberman, 1949; Veroff, Wilcox and Atkinson, 1953; Feather, 1961). Because findings from TAT and self-report measures that aimed to assess achievement motives were seldom correlated (see Schultheiss & Brunstein, 2001), McClelland (1980) argued that self-attributed motives, as measured by questionnaires, predict immediate, situation-specific choices (McClelland, Koestner, & Weinberger, 1989), while implicit motives, measured by story-based measures, predict spontaneous behavior over varying periods of time.

Recently, Brunstein and Schmitt (2004) have compared implicit and explicit methods for assessing individual differences in achievement motives. However, instead of using the TAT, they experimented with an Implicit Association Test (IAT, Greenwald, McGhee, & Schwartz, 1998) and found yet again that implicit and explicit measures of achievement orientation were uncorrelated. However, while participants' self-reports about achievement orientations only predicted self-reports about whether students had enjoyed the task (a mental concentration test), Brunstein & Schmitt's IAT successfully predicted students' behavior.

IATs were developed in the early 1990's to meet the perceived need for indirect measures that could access those cognitions that self-report measures could not (Greenwald et al., 2002, p. 4). The test measures the strength of

associations between concepts in an individual's mind, as well as the extent of the individual's awareness of and belief in these associations (Greenwald, McGhee, & Schwartz, 1998, p. 1464). Test procedure involves presenting participants with a computerized sorting task where they have to respond as quickly as possible in categorizing presented stimuli to specified categories (<https://implicit.harvard.edu/implicit/>).

In a typical test, participants are first presented with a computer screen which has the words "Good" and "Bad" in the top left and right of the screen, respectively. Single target words are presented in the middle of the screen and participants have to indicate whether the word is good or bad by pressing the "E" or "I" on the keyboard, respectively. Typical words to be categorized include "joy", "love", "peace" and "wonderful" as good words, and "awful", "agony", "terrible", and "evil" as bad words. Once the participant has practiced this categorization, a second set of categories is presented, for example, with "African American" and "European American" on the top left and right of the screen, respectively. Images of the faces of members of these two groups appear in the center of the screen, and participants must very quickly categorize faces as African American using the "E" key, or European American using the "I" key. After a similar number of practice trials, the third, critical block of the experiment begins. Participants allocate stimuli (previously presented good and bad words and face images) to combined categories using the *same* key (i.e., "African American" and "Good" pressing the "E" key, "European American" and "Bad", pressing "I"). In the fourth (practice) and fifth (critical) blocks of the experiment, participants carry out the same categorization, but with the categories switched around (i.e., "African American" and "Bad", "European American" and "Good") in order to address ordering effects.

The logic is that quicker reaction times imply the two concepts are automatically associated and congruent in the participants' minds. When the word pair is not automatic and incongruent in the participant's mind, reaction times are slower. So if participants are consistently quicker to categorize negative stimulus words to "Bad" when it is paired with "African American" than when it is paired with "European American", the results would suggest a

preference for European Americans, with degrees of slight, moderate and strong preference also calculated. Because the IAT requires very quick response latencies, it avoids intervening thoughts and the time to come up with “self-presentation strategies” (Greenwald, McGhee, & Schwartz, 1998, p. 1465), which were earlier discussed as some of the problems with interviews, and affect, albeit to a lesser extent, anonymous questionnaires. In line with our proposed conceptualization of the cognitive representation of goals as a system of nodes, quicker reaction times would indicate the automatic activation by stimuli words of those *strengthened and most readily activated paths*. If the activated nodes on that path are collectively congruent with a positive approach to normative comparison, for example, then when a performance approach stimulus word appears, a faster categorization response would theoretically be seen. If there is no association or the path is collectively incongruent with a positive approach to such a concept, then a slower response time may be seen. As such, IATs might be one answer for researchers interested in assessing achievement goals.

The idea that IATs can be used to assess constructs that have commonly been assessed using questionnaire and/or interview techniques is not new. In addition to Brunstein and Schmitt’s (2004) successful adaptation for implicit motives, authors within achievement goal research have also begun employing IATs. At the American Educational Research Association conference in 2011, Urdan and Cafasso reported their initial attempts to build a ‘Like Me’ IAT, in which participants were presented with words describing achievement goals in the center of the screen and had to allocate these to either a “Like Me” or a “Not Me” category. Stimulus words included “improvement”, “understanding”, and “learning” for mastery goals, “winner”, “best”, and “competitive” for performance approach goals, and “inferior”, “worse”, and “incompetent” for performance avoidance goals. In total, there were eight words per goal construct, and these appeared in random order to be categorized. One of the concerns for this IAT was the range of words used as stimuli. Nouns and adjectives may have variable processing times, thereby providing an alternative explanation for slower reaction times that is not attributable to a lack of automatic association. In addition, IATs determine

whether an association is automatic, and the individual's implicit preference, by measuring response times, not by explicitly asking the participants if they are like or unlike the words appearing on the screen in front of them. Another example of an IAT for achievement goals is the IAT-Type (IAT-T) measure piloted by Marzouq, Carr, and Slade (2012), which uses the 2 x 2 model of achievement goals and has so far demonstrated good reliability for each of the goals. One concern regarding this IAT is the use of more than one word at a time as the stimulus. Although this is held constant for all goal stimuli, it does not rule out a potential impact on processing time, again unattributable to a lack of automatic association..

In addition, the current authors have designed and tested two dichotomous model (i.e., mastery and performance goals) achievement goal IATs. One example is the Valence IAT, which pairs “performance goals” with “good” and “mastery goals” with “bad”, and then switches in accordance with usual IAT procedure to “performance goals” and “bad” with “mastery goals” and “good”. Participants are shown performance words (e.g., “compete”, “overtake”) or mastery words (“learn”, “understand”). In this version of the IAT, we have tried as much as possible to use only verbs for stimulus words, and to use words that apply uniquely to one type of goal. Our Valence IAT operates on the underlying assumption that the speed with which participants categorize performance or mastery words into these combined categories, for example by putting the word “compete” into the combined category of “performance goals” and “bad”, gives an idea of how strongly associated these combined categories are in their heads, their goal preference and ultimately an insight into one part of the strengthened activation path connecting often activated patterns of nodes.

Clearly, although IATs have become an established research tool in fields such as stereotypes and prejudice (for a review, see Nosek, Greenwald, & Banaji, 2007) and self-esteem and self-concept (Greenwald & Farnham, 2000), their use in studying achievement goals is nascent. Indeed, it is still to be established whether an IAT that shows quicker reaction times for word pairs associated with “performance” and “good” is evidence that participants

operate with such goals in achievement settings. A further issue lies in the implications of comparing IAT measures with questionnaire and interview methods. It may be found that IATs correlate more with questionnaires than interviews, or differently depending on goal type, or that they do not correlate at all with self-reports, as was often found with the Thematic Apperception Test and is demonstrated with the IAT in Brunstein and Schmitt's (2004) study. More important will be identifying those achievement behavioral outcomes and the occasions on which the IAT can, and self-reports cannot, predict (and vice versa). Also, we still need to establish if goals are initially conscious and then move to being automatic because when this is established, IATs might actually be able to help identify when this shift occurs. As research builds, various tests of validity will help to establish the place of the IAT in goal research. For theorists interested in MMR, IATs represent an interesting opportunity to examine not just goals but a whole variety of attitude-based phenomena.

MMR and Achievement Goals Re-visited

To summarise, one of the most popular theories in achievement motivation has a problem: researchers cannot agree how to study the key constructs. Moreover, using different methods has resulted in divergent outcomes and conclusions. Considerable evidence from work on limited introspection coupled with evidence from social psychology suggests that individuals can behave in ways contrary to their espoused beliefs. Implicit Association Tests have been shown to be useful indicators of non-conscious beliefs.

For researchers interested in studying goals using MMR, the question is whether current interview and questionnaire methods should be used in conjunction with implicit methods. If research using interviews and questionnaires continues to produce divergent results, then researchers need to further assess current methods and look to other methods. IATs seem a useful and important way forward. This is especially so if, as evidence suggests, students' achievement goals may be adopted both consciously and non-consciously. It seems that it is no longer sufficient to use interviews and questionnaires without considering the implicit/explicit distinction because

current divergence in findings just produces differences in positions. It is no longer enough to say questionnaires produce different results from interviews, or to assume that goals can be accessed entirely through self-reports. We think it important for goal theorists to employ a variety of methods when studying goals, but this means the field has to reach some agreement regarding whether the constructs *can* be triangulated using different methods. If goal theorists want to develop useful predictive models, then constructs need at least to be consistent across different measures.

For researchers who do not study goal theory, the implications of IATs are potentially far-reaching and infinitely more controversial; divergence between methods implies the potential inadequacy of self-report to provide accurate introspective insight. This is not our position. We urge researchers to re-examine the constructs they research by using techniques that appeal to the literature underpinning IAT development. When we sat down with many of the authors we have cited and asked them why they were so sure students were reporting their goals accurately, the reply was often “how can you ever be sure?” Our reply is that it is better not to assume you can or cannot but to develop methodologies that build confidence about the reliability and validity of findings. Current divergence in findings suggests methodological inappropriateness and goal theorists need to address the problem. IATs may be one way forward when examining achievement goals; they may be the way forward for other constructs as well.

Conclusions

In conclusion, adopting the mixed methods concept of divergence as a lens to re-examine current achievement goal methods highlights serious self-report limitations. Given that considerable evidence suggests our ability to access these goals is limited, paradigms used for measuring achievement goals (and similar social psychological constructs) must supersede a dichotomous view of qualitative and quantitative methods and even a lateral continuum, to consider the implications of a three-dimensional model, incorporating methods that distinguish between the consciously accessible and inaccessible. This further level of research should begin to shed light on both how achievement

goals are mentally represented and the interplay between conscious and nonconscious motivational factors activated in everyday classroom tasks. This will ultimately enhance researchers' understanding of the achievement goals students pursue and how these can be better conceptualised, measured, and, if need be, acted upon.

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