Running head: ACHIEVEMENT GOALS, DIVERGENCE, AND IMPLICIT PROCESSES

Different Methods, Different Results: Examining the implications of methodological

divergence and implicit processes for achievement goal research

Laura da Costa[1] and Richard Remedios[1]

[1] School of Education, University of Durham

Word count (exc. figures/tables): 9,887

* Correspondence concerning this article should be addressed to Laura da Costa, School of

Education, University of Durham, Leazes Road, Durham DH1 1TA, United Kingdom. Email:

l.e.da-costa@durham.ac.uk

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 multifaceted 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 masteryavoidance (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 (Urdan & 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 performanceapproach, 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; Urdan & Mestas, 2006). To avoid researcher-defined operationalizations of goals, advocates of interviews suggest investigating the meanings students themselves give to achievement goals (Urdan & 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, Urdan and Mestas (2006) asked participants to complete the PALS and then interviewed them. Focusing on participants who rated performance avoidance items highly, Urdan and Mestas found that students repeatedly provided *approach* reasons to explain their endorsements of *avoidance* items (Urdan & 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; Urdan, 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 1970s, 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' selfreports 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. 463464).

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)
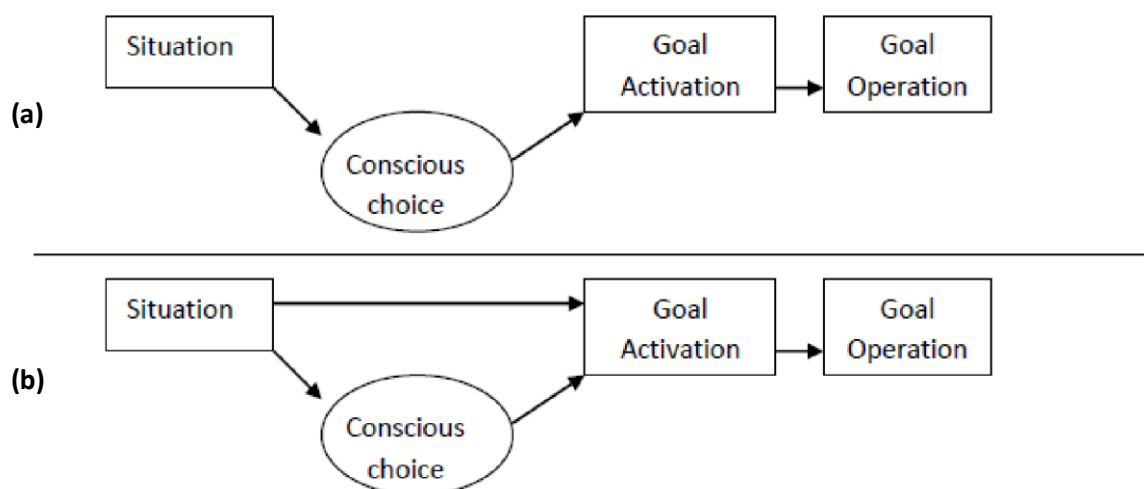
Using priming procedures, Bargh and his colleagues have been able to empirically examine this perception-to-action logic for the automatic, that is, the unintentional, effortless, and nonconscious, activation of both cognitive and behavioral goals. In an experiment examining *cognitive* goals, Chartrand 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 storybased 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 1990s 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 selfesteem 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 reexamine 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.

References

Bargh, J.A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American Psychologist, 54*, 462-479. doi:10.1037//0003-066X.54.7.462

Bargh, J.A., Gollwitzer, P.M., Lee-Chai, A., Barndollar, K., & Trötschel, R. (2001). The automated will: nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology, 81,* 1014-1027. doi: 10.1037/0022-3514.81.6.1014

Baumeister, R.F., Bratslavsky, E., Muraven, M., & Tice, D.M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, *74,* 1252-1265. doi: 10.1037//0022-3514.74.5.1252

Bem, D.J., & McConnell, H.K. (1970). Testing the self-perception explanation of dissonance phenomena: On the salience of premanipulation attitudes. *Journal of Personality and Social Psychology*, *14*, 23-31. doi: 10.1037/h0020916

Brophy, J. (2005). Goal Theorists Should Move on From Performance Goals. *Educational Psychologist*, *40*, 167-176. doi: 10.1207/s15326985ep4003_3

Brunstein, J. C., & Schmitt, C. H. (2004). Assessing individual differences in achievement motivation with the Implicit Association Test. *Journal of Research in Personality***, *38*, 536-555. doi: 10.1016/j.jrp.2004.01.003

Butler, R., (1987). Task-involving and ego-involving properties of evaluation: Effects of different feedback conditions on motivational perceptions, interest and performance. *Journal of Educational Psychology, 79,* 474-482. doi:10.1037/0022-0663.79.4.474

Chartrand, T.L. (1999). *Consequences of automatic motivation for mood, self-efficacy, and subsequent performance*. Unpublished doctoral dissertation, New York University.

Chartrand, T.L., & Bargh, J.A. (1996). Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions. *Journal of Personality and Social Psychology*, *71*, 464-478. doi: 10.1037//0022-3514.71.3.464

Ciani, K.D., & Sheldon, K.M. (2010). Evaluating the mastery-avoidance goal construct: A study of elite college baseball players. *Psychology of Sport and Exercise, 11,* 127-132. doi:10.1016/j.psychsport.2009.04.005

Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum.

Diener, C.I., & Dweck, C.S. (1978). An analysis of learned helplessness: Continuous changes in performance, strategy, and achievement cognitions following failure. *Journal of Personality and Social Psychology*, *36*, 451-462. doi: 10.1037//0022-3514.36.5.451

Diener, C.I., & Dweck, C.S. (1980). An analysis of learned helplessness: II. The processing of success. *Journal of Personality and Social Psychology*, *39*, 940-952. doi: 10.1037//0022-3514.39.5.940

Elliot, A.J. (2005). A Conteptual History of the Achievement Goal Construct. In Elliot, A.J. & Dweck, C.S. (Eds.), *Handbook of competence and motivation* (pp. 52-72). New York: Guildford Press.

Elliot, A.J., & Church, M.A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72,* 218-232. doi:10.1037/0022-3514.72.1.218

Elliot, A.J. & Fryer, J.W. (2008). The Goal Construct in Psychology. In Shah, J.Y. & Gardner, W.L. (Eds.), *Handbook of Motivation Science* (pp. 235-250). New York: Guildford Press.

Elliot, A.J., & Harackiewicz, J.M. (1996). Approach and Avoidance Achievement Goals and Intrinsic Motivation: A Mediational Analysis. *Journal of Personality and Social Psychology, 70*, 461- 475. doi: 10.1037/0022-3514.70.3.461

Elliot, A.J., & McGregor, H.A. (2001). A 2 x 2 achievement goal framework. *Journal of*

Personality and Social Psychology, *80*, 501-519. doi: 10.1037/0022-3514.80.3.501

Elliot, A.J., & Murayama, K. (2008). On the Measurement of Achievement Goals: Critique, Illustration, and Application. *Journal of Educational Psychology*, *100,* 613-628. doi: 10.1037/0022-0663.100.3.613

Elliot, A.J., Murayama, K., & Pekrun, R. (2011). A 3 x 2 achievement goal model. *Journal of Educational Psychology, 103,* 632-648. doi: 10.1037/a0023952

Elliott, E.S., & Dweck, C.S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology, 54*, 5-12. doi:10.1037/0022-3514.54.1.5

Erzberger, C., & Prein, G. (1997). Triangulation: Validity and empirically-based hypothesis construction. *Quality & Quantity, 31*, 141-154. doi: 10.1023/A:1004249313062

Feather, N.T. (1961). The relationship of persistence at a task to expectation of success and achievement related motives. *Abnormal Social Psychology, 63,* 552-561. doi:10.1037/h0045671

Gazzaniga, M.S. (2000). Cerebral specialization and interhemispheric communication: Does the corpus callosum enable the human condition? *Brain, 123*, 1293-1326. doi: 10.1093/brain/123.7.1293

Gollwitzer, P. M., & Bargh, J. A. (2005). Automaticity in goal pursuit. In Elliot, A.J., & Dweck, C.S. (Eds). *Handbook of competence and motivation.* (p.624-646). New York. Guilford Press.

Gopnik, A. (1993). How we know our minds: The illusion of first-person knowledge of intentionality. *Behavioral and Brain Sciences, 16,* 1-14. doi: 10.1017/S0140525X00028636

Graham, H., & Golan, S. (1991). Motivational influences on cognition: Task involvement, ego involvement, and depth of information processing. *Journal of Educational*

Psychology, 83, 187-194. doi:10.1037/0022-0663.83.2.187

Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Mellott, D. S. (2002). A unified theory of implicit attitudes, stereotypes, self-esteem, and selfconcept. *Psychological Review*, *109*, 3-25. doi: 10.1037/0033-295X.109.1.3

Greenwald, A.G., & Farnham, S.D. (2000). Using the Implicit Association Test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology, 79,* 1022-1038. doi:10.1037/0022-3514.79.6.1022

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology, 74*, 1464-1480. doi: 10.1037/0022-3514.74.6.1464

Hamilton, D.L., Katz, L.B., & Leirer, V.O. (1980). Organizational processes in impression formation. In Hastie, R., Ostrom, T.M., Ebbesen, E.B. , Wyer, R.S. , Hamilton, D.L. & Carlston, D.E. (Eds.), *Person memory: The cognitive basis of social perception* (pp. 121-153). Hillsdale, NJ: Erlbaum.

Harackiewicz, J.M., Barron, K.E., Carter, S.M., Lehto, A.T., & Elliot, A.J. (1997). Predictors and consequences of achievement goals in the college classroom: Maintaining interest and making the grade. *Journal of Personality and Social Psychology, 73*, 1284-1295. doi: 10.1037/0022-3514.73.6.1284

Hulleman, C.S., Schrager, S.M., Bodmann, S.M., & Harackiewicz, J.M. (2010). A metaanalytic review of achievement goal measures: Different labels for the same constructs or different constructs with similar labels? *Psychological Bulletin, 136,* 422-449. doi:

10.1037/a0018947

James, W. (1890). *Principles of psychology.* New York: Henry Holt.

Job, V., Langens, T.A., & Brandstätter, V. (2009). Effects of achievement goal striving on well-being: The moderating role of the explicit achievement motive. *Personality and Social Psychology Bulletin, 35,* 983-996. doi: 10.1177/0146167209336606

Kihlstrom, J.F. (1987). The Cognitive Unconscious. *Science*, *237*, 1445-1452. doi: 10.1126/science.3629249

Latané, B., & Darley, J.M. (1970). *The un-responsive bystander: Why doesn't he help?* New York: Appleton-Century-Crofts.

Levy, I., Kaplan, A., & Patrick, H. (2004). Early adolescents' achievement goals, social status, and attitudes towards cooperation with peers. *Social Psychology of Education*, *7*, 129-159. doi: 10.1023/B:SPOE.0000018547.08294.b6

Lemos, M. (1996). Students' and Teachers' Goals in the Classroom. *Learning and Instruction*, 6 (2): 151-171. doi: 10.1016/0959-4752(95)00031-3

Mandler, G. (1975). *Mind and emotion.* New York, NY: Wiley.

Marzouq, S., Carr, A., & Slade, L. (2012, March). *Developing Implicit Association Test measures of Achievement Goals: Pilot studies at Roehampton and Durham.* Presented at Achievement goals: From self-report to implicit association measures, Roehampton University, London.

McClelland, D.C. (1980). Motive dispositions: The merits of operant and respondent measures. In L. Wheeler (Ed.), *Review of personality and social psychology* (Vol. 1, pp. 10-41). Beverly Hills, CA: Sage.

McClelland, D.C., Atkinson, J.W., Clark, R.A., & Lowell, E.L. (1953). *The Achievement Motive*. New York: Appleton-Century-Crofts.

McClelland, D.C., Koestner, R., & Weinberger, J. (1989). How do self-attributed and implicit motives differ? *Psychological Review, 96,* 690-702. doi:10.1037/0033-295X.96.4.690

McClelland, D.C., & Liberman, A.M. (1949). The Effect of Need For Achievement on

Recognition of Need-Related Words. *Journal of Personality, 18,* 236-251.

doi:10.1111/j.1467-6494.1949.tb01243.x

Middleton, M.J., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An

unexplored aspect of goal theory. *Journal of Educational Psychology, 89,* 710-718.

doi:10.1037/0022-0663.89.4.710

Midgley, C., Maehr, M.L., Hruda, L.Z., Anderman, E., Anderman, L., Freeman, K.E., et al.

(2000). *Manual for the Patterns of Adaptive Learning Scales (PALS).* Ann Arbor:

University of Michigan.

Midgley, C., & Urdan, T. (2001). Academic Self-Handicapping and Achievement Goals: A

Further Examination. *Contemporary Educational Psychology, 26,* 61-75.

doi:10.1006/ceps.2000.1041doi:10.1006/ceps.2000.1041

Miller, G.A. (1962). *Psychology: The science of mental life.* New York: Harper & Row.

Morgan, C.D., & Murray, H.A. (1935). A method for investigating fantasies: The Thematic

Apperception Test. *Archives of Neurology and Psychiatry, 34,* 289-306.

doi:10.1001/archneurpsyc.1935.02250200049005

Muraven, M., Tice, D.M., & Baumeister, R.F. (1998). Self-control as limited resource:

Regulatory depletion patterns. *Journal of Personality and Social Psychology*, *74*, 774-

789. doi: 10.1037/0022-3514.74.3.774

Murphy, K.P., & Alexander, P.A. (2000). A Motivated Exploration of Motivation

Terminology. *Contemporary Educational Psychology, 25*, 3-53. doi:

10.1006/ceps.1999.1019

Neisser, U. (1967). *Cognitive Psychology.* New York: Appleton-Century-Crofts.

Nicholls, J.G. (1984). Achievement motivation: Conceptions of ability, subjective experience,

task choice, and performance. *Psychological Review, 91,* 328-346.

doi:10.1037/0033-295X.91.3.328

Nicholls, J.G. (1989). *The competitive ethos and democratic education.* Cambridge, MA: Harvard Univ. Press.

Nisbett, R.E., & Bellows, N. (1976). *Accuracy and inaccuracy in verbal reports about influences on evaluations.* Unpublished manuscript, University of Michigan, Ann Arbor, MI.

Nisbett, R.E., & Schachter, S. (1966). Cognitive manipulation of pain. *Journal of Experimental Social Psychology*, *2*, 227-236. doi: 10.1016/0022-1031(66)90081-3

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*, 231-259. doi: 10.1037/0033-295X.84.3.231

Nosek, B.A., Greenwald, A.G., & Banaji, M.R. (2007).The Implicit Association Test at Age 7: A Methodological and Conceptual Review. In J.A. Bargh (Ed.), *Automatic processes in social thinking and behavior* (pp. 265-292). New York: Psychology Press.

Pintrich, P.R. (2000). An Achievement Goal Theory Perspective on Issues in Motivation Terminology, Theory, and Research. *Contemporary Educational Psychology*, *25*, 92-104. doi: 10.1006/ceps.1999.1017

Renninger, K. A., Hidi, S., & Krapp, A. (Eds.). (1992). *The role of interest in learning and development*. Hillsdale, NJ: Erlbaum.

Ryan, A.M., & Pintrich, P.R. (1997). "Should I Ask for Help?" The Role of Motivation and Attitudes in Adolescents' Help Seeking in Math Class. *Journal of Educational Psychology, 89,* 329-341. doi:10.1037/0022-0663.89.2.329

Schultheiss, O.C., & Brunstein, J.C. (2001). Assessment of implicit motives with a research version of the TAT: Picture profiles, gender differences, and relations to other personality measures. *Journal of Personality Assessment, 77,* 71-86. doi:

10.1207/S15327752JPA7701_05

Senko, C. &, Hulleman, C. S, & Harackiewicz, J. M. (2011). Achievement goal theory at the crossroads: Old controversies, current challenges, and new directions. *Educational Psychologist, 46*, 26-47. doi: 10.1080/00461520.2011.538646

Smith, E.R. (1998). Mental representation and memory. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology.* 4th ed., Vol. 1. (pp. 391-445). New York: Oxford Univ. Press.

Stipek, D., & Kowalski, P. (1989). Learned helplessness in task-orienting versus performance-orienting testing conditions. *Journal of Educational Psychology, 81,* 384-391. doi:10.1037/0022-0663.81.3.384

Teddlie, C., & Tashakkori, A. (2003). Major Issues and Controversies in the Use of Mixed Methods in the Social and Behavioral Sciences. In Tashakkori, A., & Teddlie, C. (Eds.), *Handbook of Mixed Methods in Social and Behavioral Research* (pp. 3-50). London: Sage.

Teddlie, C., & Tashakkori, A. (2010). Overview of Contemporary Issues in Mixed Methods Research. In Tashakkori, A., and Teddlie, C. (Eds.), *Sage Handbook of Mixed Methods in Social & Behavioral Research* (pp. 1-44). 2nd ed. London: Sage.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 184,* 1124-1131. doi:10.1126/science.185.4157.1124

Urdan, T. (2001). Contextual influences on motivation and performance: An examination of achievement goal structures. In Salili, F., Chiu, C., & Hong, Y. (Eds.), *Student motivation: The culture and context of learning* (pp. 171–201). New York: Kluwer/Plenum.

Urdan, T. (2004a). Using multiple methods to assess students' perceptions of classroom goal structures. *European Psychologist 9,* 222-231. doi: 10.1027/1016-9040.9.4.222

Urdan, T. (2004b). Predictors of academic self-handicapping and achievement: Examining achievement goals, classroom goal structures and culture. *Journal of Educational Psychology, 96,* 251-264. doi: 10.1037/0022-0663.96.2.251

Urdan, T., & Cafasso, S. (2011, April). *Using Multiple Methods to Understand the Nature of Achievement Goals*. Presented at AERA Annual Conference, New Orleans, LA.

Urdan, T., Kneisel, L., & Mason, V. (1999). Interpreting messages about motivation in the classroom: Examining the effects of achievement goal structures. In Urdan, T. (Ed.), *The role of context* (pp. 123-158). Stamford, CT: JAI.

Urdan, T.C., & Maehr, M.L. (1995). Beyond a two-goal theory of motivation and achievement: A case for social goals. *Review of Educational Research, 65,* 213-243. doi:10.3102/00346543065003213

Urdan, T., & Mestas, M. (2006). The Goals Behind Performance Goals. *Journal of Educational Psychology*, *98*, 354-365. doi: 10.1037/0022-0663.98.2.354

Urdan, T., & Turner, J. C. (2005). Competence motivation in the classroom. In Elliot, A.J., & Dweck, C.S. (Eds.), *Handbook of Competence and Motivation* (pp. 297-317). New York: The Guilford Press.

Valins, S., & Ray, A.A. (1967). Effects of cognitive desensitization on avoidance behavior. *Journal of Personality and Social Psychology*, *1*, 345-350. doi: 10.1037/h0025239 van Yperen, N.W. (2003). Task interest and actual performance: The moderating effects of assigned and adopted purpose goals. *Journal of Personality and Social Psychology, 85,* 1006-1015. doi:10.1037/0022-3514.85.6.1006

Veroff, J., Wilcox, S., & Atkinson, J.W. (1953). The achievement motive in high school and college age women. *Journal of Abnormal and Social Psychology, 48,* 108-119. doi: 10.1037/h0055017

Wegner, D.M. (2002). *The Illusion of Conscious Will*. London: Bradford Books/MIT Press.

Wentzel, K.R. (1989). Adolescent classroom goals, standards for performance, and academic achievement: An interactionist perspective. *Journal of Educational Psychology, 81,* 131-142. doi:10.1037/0022-0663.81.2.131

Wentzel, K.R. (1991). Relations between social competence and academic achievement in early adolescence. *Child Development, 62,* 1066-1078. doi:10.2307/1131152

Wigfield, A., & Eccles, J. S. (2000). Expectancyvalue theory of achievement motivation. *Contemporary Educational Psychology*, *25*, 68-81. doi: 10.1006/ceps.1999.1015