The Impact of Induced State Achievement Goal Orientation on Performance, Motivation, Self-efficacy, and Enjoyment: A Meta-Analysis

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Abstract

By examining the effects of experimentally induced achievement goal orientations (i.e., performance-approach, mastery-approach, performance-avoidance, and mastery-avoidance goals) on performance, motivation, self-efficacy, and enjoyment, this meta-analysis was able to shed light on the inconsistent previous findings regarding the relationship between state achievement goal orientations and the aforementioned outcomes. Ninety-three empirical studies, comprising 308 effect sizes and 14,984 participants were coded on several study and socio-demographic characteristics. The results indicated that mastery-approach goals were more beneficial for performance and self-efficacy than performance-approach and performance-avoidance goals, and mastery-approach and performance-approach goals were more beneficial for motivation than performance-avoidance goals. In addition, several goal orientation-performance relationships differed significantly from each other as a function of goal standard, age, and gender. These findings demonstrate that state achievement goal orientations have robust effects on performance, motivation, self-efficacy, and enjoyment. Future research should explore the effects of mastery-avoidance goals, as the research on mastery-avoidance goals is scarce.

Keywords: achievement goals, state achievement goal orientation, meta-analysis, performance, motivation, self-efficacy, enjoyment

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Goals play an important role in an individual's life because they influence individuals' attention, effort, and persistence levels. Goals are thus important tools, but perhaps more important are the reasons why individuals set these goals. This motivation behind achievement related behavior is also referred to as the achievement goal orientation.

Over the years the achievement goal orientation theory (Ames, 1992; Dweck, 1986; Nicholls, 1984) has been established as an important area of research dedicated to explaining the reasons behind the preference for certain goals in achievement situations. The achievement goal orientation (GO) theory provides a framework for research on individual motivation in all kinds of situations, for example at the workplace or at school. GO was originally studied by developmental and educational psychologists (e.g., Dweck, 1975). But more recently, industrial and organizational psychologists have also applied the GO theory to explain observed differences in job performance (e.g., Button, Mathieu, & Zajonc, 1996).

The popularity of research on GO theory and the increasing numbers of studies on this theory, has resulted in different interpretations and conceptualizations of central concepts and research methods (Elliot, 2005; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). Initially, researchers examining motivation and self-regulated learning (e.g., Dweck, 1986, 1992; Nicholls, 1984) had identified two broad achievement goal orientations: performance goals and mastery goals. Performance goals (i.e., ability or ego goals) refer to an individuals' preference for demonstrating skills and ability. Individuals who pursue performance goals might also be concerned with outperforming others rather than simply demonstrating their own abilities. In contrast, mastery goals (i.e., learning or task goals) refer to an individual's preference for developing skills and acquiring new knowledge. In addition to the distinction between

performance goals and mastery goals, more recent conceptualizations of GO theory have made a distinction between the valences of mastery and performance goals (e.g., Elliot, 1999; Elliot & McGregor, 2001). More specifically, achievement goals can be further broken down into approach or avoidance forms, resulting in a 2x2 framework. This framework contains four achievement goal orientations: performance-approach (PAp: 'I want to outperform my classmates on the work and organizational exam'), mastery-approach (MAp: 'I want to learn as much as I can about work and organizational psychology'), performance-avoidance (PAv: 'I want to avoid performing worse than my classmates on the work and organizational exam'), and mastery-avoidance (MAv:' I want to avoid performing worse on the work and organizational exam than I did last year'). PAp GO's involve demonstrating one's competence whereas PAv GO's involve avoiding the demonstration of incompetence. Individuals who pursue MAp goals focus on gaining knowledge and skill while MAv goals emphasize a focus on avoiding losing skills or not learning as much as one could (Elliot & McGregor, 2001).

GO can be described as a dispositional (trait) or a situational (state or domain-specific) mental framework that determines how people react to situations in which they have to perform (Elliot, 2005). A trait GO can be described as a stable, enduring predisposition to adopt a particular orientation in all kinds of situations wherein an individual wants to achieve something, whereas a situational GO can be described as a more transient situational-specific orientation influenced by contextual factors (Elliott, 2005). A domain-specific GO is a more or less stable GO framework to adopt a particular orientation in a specific domain, such as sport or work. A certain state GO can be induced or primed by specific experimental manipulations (e.g., an instruction to adopt a certain goal for a task, Van Yperen, 2003) which can activate a certain mind-set or schema of achievement situations. The activation of those schemas of achievement

situations is supposed to guide thoughts, feelings, and behavior in correspondence with this orientation (Kaplan & Maehr, 2007).

A number of meta-analyses have been conducted on trait and domain-specific GO (e.g., Hulleman et al., 2010; Payne et al., 2007). The results of these meta-analyses showed that PAp GO was unrelated, mastery GO was positively related, and PAv GO was negatively related to a number of outcomes, including self-efficacy, learning, and performance. However, to my knowledge, to date only two published meta-analyses have addressed induced state achievement goal orientations (i.e., Rawsthorne & Elliot, 1999; Utman, 1997). Utman's meta-analysis of 24 studies, in which mastery and performance GO were manipulated prior to an experimental task, showed that for complex tasks mastery goals lead to better performance than performance goals. Rawsthorne and Elliot's (1999) meta-analysis of 30 studies, examined the effect of experimentally induced mastery and performance goal orientation on motivation. They found that, compared to mastery goals, performance-avoidance goals undermine intrinsic motivation. Since the meta-analyses by Rawsthorne and Elliot, and by Utman, the number of studies investigating the effects of state GO (e.g., Avery & Smillie, 2013; Chalabaev, Major, Sarrazin, & Cury, 2012) have dramatically increased. Although the number of studies has increased, after 30 years of examining the effects of induced state GO, there are still inconsistencies in outcomes. Therefore, it is important to conduct a new meta-analysis to obtain a complete and up-to-date picture of the effects of induced state GO.

The current meta-analysis differs in several ways from the previous meta-analyses. First, I examined all studies published and unpublished between 1984 and 2013 in which state GO is experimentally induced. Second, both the manipulation of goal content as well as the manipulation of GO climate was examined. Third, extending the previous meta-analyses on state GO, I examined the relationship between state GO and motivation, performance, self-efficacy,

and enjoyment; factors that have been shown to be differentially related to the four trait GO's (e.g., Payne et al., 2007). For example, trait PAp goals are found to be unrelated to performance and self-efficacy, while trait MAp goals are positively related to these variables (Payne et al., 2007). These factors may also relate differentially to the four state GO's as trait GO is a predictor of state GO (Payne et al., 2007). Fourth, I looked at the 2x2 framework of GO comparing the manipulation of PAp, MAp, PAv, and MAv goals. Fifth, in contrast with previous meta-analyses on state GO, the experimental groups were compared to no-goal control groups. Finally, because previous meta-analyses sometimes failed to find significant effect for moderators, I attempted to identify potential moderators of the relationship between state GO and the abovementioned outcomes. By systematically exploring if moderators can account for the variance in the effects of achievement GO on performance, I seek to extend previous meta-analyses on state GO.

The purpose of this study was to examine the effects of experimentally manipulated (i.e., state) achievement goal orientations on the aforementioned outcomes, using a meta-analysis technique. For this purpose, both studies that manipulate goal content (i.e., PAp, MAp, PAv, or MAv goals) as well as studies that manipulate the climate (i.e., a PAp, MAp, PAv, or MAv oriented climate) have been included in the analysis. The second goal of this study was to identify factors that may explain any inconsistencies in the effects of experimentally induced achievement goal orientations on performance, motivation, self-efficacy, and enjoyment. Several factors were examined as a possible explanation for inconsistencies in the effect sizes, including the goal framing, goal standard, achievement domain, and several sample (i.e., gender, age, and nationality) and study characteristics (i.e., sample size and publication status). With this study I aim to provide a base for further theoretical advancement of the GO theory and to help develop and evaluate interventions that are based on the GO theory. Findings of this study may help

instructors to create an effective work or learning environment by creating and emphasizing a beneficial achievement goal orientation climate.

Achievement Goal Orientation

History of Achievement Goal Orientation

Dweck (1975) and Nicholls (1976, 1978) independently developed the construct of achievement goal orientation (GO) in the 70's. Dweck's conceptualization of GO emerged from her research into the way children develop and demonstrate their competence. Dweck and colleagues (Diener & Dweck, 1978; Dweck, 1975; Dweck & Leggett, 1988) demonstrated that children with the same level of ability can react differently when they fail at tasks. Some children ascribe their failure to a lack of ability, while other children ascribe this failure to a lack of effort. Dweck explained this difference in response patterns using the concept of GO. GO's are mental representations, representing the desired level of competency and help to ensure that certain behavior is shown in achievement situations. In contrast to Dweck, Nicholls's (1976, 1978) conceptualization of achievement goals arose from his research on the development of children's conceptions of ability. According to Nicholls, children begin with an undifferentiated conception of ability in which they do not distinguish between ability and effort. This conception of ability changes around the age of 12, when children begin to make a distinction between ability and effort. From that time on, individuals have a more differentiated conception of ability (i.e., ability is a fixed capacity, which does not depend on the effort that is put in) but they can also have an undifferentiated conception of ability (i.e., the more effort you put into something, the more you learn and the more skilled you become).

Although Dweck and Nicholls differ in the ways in which they explain GO, their conceptualization of GO is the same. Furthermore, they both agree that individuals can pursue two types of goals: performance (or ego) goals, where the objective is to demonstrate one's own

competence to others and mastery (or task) goals, involving the aim to develop one's own competence (e.g., Dweck & Leggett, 1988; Nicholls, 1978). According to Dweck, these different goals result from implicit theories that people have about ability. According to this perspective a belief that ability is stable (i.e., entity theory) results in performance goals and a belief that competence is variable (i.e., incremental theory) results in mastery goals. However, according to Nicholls (1976), having different goals results from the way in which individuals define their success. Success is defined by demonstrating one's capacities by outperforming others (i.e., ego goals) or by hard work and perseverance resulting in mastering tasks (i.e., task goals). In the following, I used the terms performance and mastery goals.

Conceptualization of Achievement Goal Orientation

Both Dweck (1975) and Nicholls (1976) initially studied GO as a dispositional trait that individuals possess, but more recent studies on GO indicate that individuals can hold more transient situational-specific orientations that are influenced by contextual factors. Therefore, GO can be described as a trait, domain-specific, or as a state-like construct. Domain and state GO are also referred to as situation-specific goal orientations.

Trait achievement goal orientation. Originally, GO was described as a stable, dispositional trait. In this definition, a person's GO is considered to be a general trait that applies to all domains and situations (e.g., Nichols, 1992). Research examining GO as a trait has predominately used self-report questionnaires (e.g., Button et al., 1996). These survey measures of achievement goals can be used to assess different relationships between trait GO and a number of outcomes such as self-efficacy, learning, and performance (e.g., Payne et al., 2007).

Situation-specific achievement goal orientation. GO can also be situation specific including both domain specific GO (e.g., at work; VandeWalle, 1997) as well as state GO (e.g., experimentally induced; Steele-Johnson, Beauregard, Hoover, & Schmidt, 2000).

Domain specific achievement goal orientation. Individuals can have a specific GO within a certain context or domain, such as, school, sports, or work. Although a domain-specific GO varies across contexts, it remains stable within a given domain. Researchers examining domain-specific GO have used self-report questionnaires, adapting the items to the domain of interest (e.g., VandeWalle, 1997). Researchers have also assessed the structure or climate of achievement settings (i.e., an emphasis on learning or mastery versus an emphasis on performance) and demonstrated that this structure or climate influenced certain outcomes such as the attitudes toward the class (Ames & Archer, 1988; Maehr, 1984). Ames and Archer (1988) had students indicate their perceptions of the classroom GO and found that students who perceived an emphasis on mastery goals in the classroom used more effective strategies and preferred challenging tasks, whereas students who perceived performance goals as salient tended to focus on their ability, and attributing failure to lack of ability.

State achievement goal orientations. Differences in cues, such as the focus on attaining competence in achievement settings or the instruction to outperform others can alter the probability of adopting a particular GO. Experimental research has demonstrated that individuals can be temporarily manipulated to prefer a specific state GO (e.g., Noordzij, Van Hooft, Van Mierlo, Van Dam, & Born, 2013). Manipulating individuals to adopt a particular GO (i.e., goal framing) can be done in several ways: assigning individuals a certain GO (goal content; e.g., Van Yperen, 2003; Van Yperen, Elliot, & Anseel, 2009), manipulating the motivational climate in which an individual wants to achieve something (goal climate; e.g., Mangos & Steele-Johnson, 2001) or a combination of both goal content and goal climate (e.g., Noordzij, et al., 2013).

Goal content is usually manipulated by assigning individuals a certain achievement goal orientation. This type of experimental manipulation essentially consists of statements that describe the purpose of the task in terms of demonstrating ability (performance goals) or learning

or increasing performance (mastery goals). In a study by Van Yperen (2003), for example, participants were, beside others, assigned to one of the following goals: perform better than the average total score in your norm group (performance goal) or perform better than your total score in the previous task (mastery goal).

Goal climate is usually manipulated by changing the structure or climate of achievement settings in such a way that it places a focus on learning or performing, without explicitly giving a goal to participants. Achievement settings can be performance or mastery oriented depending on the cues and feedback given by the teacher, experimenter, team leader, or coach (e.g., Barkoukis, Tsorbatzoudis, & Grouios, 2008). The structure of achievement settings (i.e., an emphasis on competition versus an emphasis on learning and mastery) can influence the adoption of a certain GO. Achievement climates can be manipulated through a focus or a lack of focus on development, progress and learning from mistakes. When competition and social comparison are emphasized, and cooperation with peers is discouraged, the motivational climate is likely to promote a performance GO. On the other hand, individuals are more likely to adopt a mastery GO when they are involved in making choices and decisions and when success is defined in terms of effort, progress, and improvement. For example, in the study by Barkoukis and colleagues (2008), instructors taught basketball to students in either a learning climate or a control climate during seven months. In the learning climate, the students were allowed to work at their own level and were encouraged to set specific and short-term goals, as opposed to the control climate in which the students received regular psychical education instructions. The results of this study showed that students who were allowed to work at their own level and were encouraged to set specific and short-term goals performed better and had more intrinsic motivation compared to the students who received regular psychical education instructions.

The purpose of the current meta-analysis is to investigate the effects of induced state achievement goal orientation (i.e., goal content as well as goal climate).

Dimensions of Achievement Goal Orientation

Since the development of the GO construct (Dweck, 1975; Nicholls, 1976), researchers have agreed about the distinction between performance and mastery goal orientation. However, they do differ somewhat in the number and definitions of the achievement goals that individuals adopt in situations in which they want to achieve something (Hulleman et al., 2010; Pintrich, 2000). Initially, an achievement goal orientation was categorized according to the way in which competence was defined; recently the GO's are being categorized according to their focus. Initially, performance goals were considered to be aimed at ability or outperforming others (Ames, 1992; Dweck & Leggett, 1988; Nicholls, 1984), while mastery goals were considered to be characterized by the development of a skill or mastery of a task. In addition to their purpose, achievement GO are recently also distinguished by their focus (Elliot, 1999). Performance goals have typically been described as focusing on interpersonal or normative standards. Mastery goals, on the other hand, have typically been described as focusing on both absolute standards as well as on intrapersonal standards. Thus, individuals pursuing a performance goal focus on attaining an other-referenced standard (e.g., doing better than others), whereas individuals pursuing a mastery goal focus on attaining either a task-referenced standard (e.g., doing well on a task), or a self-referenced standard (e.g., doing better than one has done before).

Mastery and performance goals were presumed to lead to different patterns of affect, cognition and (achievement) behavior. In the achievement goal literature (e.g., Dweck, 1986), the adoption of a performance goal is hypothesized to cause a motivational response that is characterized by attribution of failure to a lack of ability and decreased task enjoyment (Dweck & Leggett, 1988). This motivational pattern occurs because performance goals are construed as an

evaluative motivational state that might lead to negative affect, cognition and behavior. The adoption of a mastery goal on the other hand is hypothesized to produce an adaptive motivational pattern that is characterized by higher levels of persistence, effort, and self-regulation and increased task enjoyment Dweck & Leggett, 1988). This motivational pattern occurs because mastery goals are construed as an intrinsically motivated state. Therefore, mastery goals were hypothesized to be more beneficial than performance goals (Dweck & Leggett, 1988).

Research on the relationship between achievement goals and performance however, has not yielded uniform results. In some cases, performance goals have been found to result in better performance than mastery goals (e.g., Pintrich 2000), while in other cases mastery goals have been found to result in better performance (e.g., Ames, 1992; Ames & Archer, 1988; Dweck, 1986). In yet other cases, no differences were found in the effects of mastery and performance goals (e.g., Study 1A & 1B, Elliot et al., 2005). This diversity in findings suggested that performance goals were not necessarily as deleterious as hypothesized; instead they showed both negative and positive effects.

The contradictory findings regarding the relationship between achievement goals and performance led some researchers (e.g., Elliot & Church, 1997; VandeWalle, 1997) to propose an additional avoidance component of performance goals, resulting in a trichotomous perspective of GO. In this perspective, the focus of performance-approach (PAp) goals is to demonstrate one's competence compared to others, while the focus of performance-avoidance (PAv) goals is to avoid demonstrating incompetence relative to others. The conceptual idea behind this specification was that the earlier inconsistencies in the relationship between performance goals and performance could be resolved by making this distinction. The central idea was that PAp goals relate positively to performance, while PAv goals relate negatively to performance. Research on the effect of performance goals on performance has provided support for this

classification. Studies that distinguished between PAp and PAv goals have shown that PAv goals were associated with negative outcomes such as low self-efficacy and poor performance, while the results for PAp goals are inconclusive. PAp goals sometimes relate to positive outcomes, such as increased persistence and high levels of performance, while in other cases PAp goals don't relate to these outcomes (e.g., Payne et al., 2007; Rawsthorne & Elliot, 1999). Therefore, combining these two types of goals together can produce the mixed empirical pattern observed in earlier research.

Because the approach–avoidance distinction in performance goals appeared both conceptually and empirically meaningful, several researchers (e.g., Elliott & McGregor, 2001) have proposed that mastery goals should also be divided into an approach and an avoidance component. Hence Elliot and McGregor extended the trichotomous perspective further into a 2 x 2 framework. In this framework mastery-approach (MAp) goals emphasize individual progress in the mastery of new tasks, while mastery-avoidance (MAv) goals are characterized by avoiding the deterioration of competence (e.g. striving not to do worse than a previous performance). The conceptual idea behind this specification was that the relationship between mastery goals and performance could be further refined by making this distinction. The central idea was that MAp goals relate positively to performance, while MAv goals relate negatively to performance. Research on the effect of mastery goals on performance provide support for this classification. Baranik, Stanley, Bynum, and Lance (2010) found in a meta-analysis that MAv goals related negatively, although not as strongly as PAv goals, with performance and cognitive ability.

Making a distinction between mastery and performance goals thus leads to a different conclusion (i.e., MAp goals are more beneficial for performance than PAp goals) as compared to a distinction between approach and avoidance goals (i.e., approach goals are more beneficial for performance than avoidance goals). Approach goals (i.e., PAp and MAp goals) are focused on

acquiring or demonstrating competence, resulting in the perception of the achievement setting as a challenge (Elliot, 1999). This is likely to generate excitement and facilitate concentration. Avoidance goals (i.e., PAv and MAv goals) on the other hand, are focused on avoiding the demonstration of incompetence or the loss of competence, resulting in the perception of the achievement setting as a threat (Elliot, 1999). This is likely to generate anxiety and lessened concentration. Making a distinction between approach goals and avoidance goals thus leads to the conclusion that both mastery and performance goals can both be beneficial and detrimental to certain outcomes such as performance, motivation, self-efficacy, and enjoyment.

Therefore, in the next section I will explore several outcome variables that have often been associated with induced state goal orientation, as such these variables are most frequently studied as consequences of state GO. These variables include performance, motivation, self-efficacy, and enjoyment, assuming that the relationship between state GO and these outcomes depends on the distinction that is made between PAp, MAp, PAv, and MAv state goal orientation.

Outcomes of 2x2 State Achievement Goal Orientation

The patterns observed in studies that aim to induce achievement goals, usually indicate that MAp goals relate positively to adaptive learning patterns and outcomes (Pintrich, 2000), whereas PAv goals are considered to have the most deleterious influence on learning patterns and outcomes (Elliot, 2005). PAp goals have been found to have both positive and negative outcomes (e.g., Grant & Dweck, 2003; Pintrich, 2000), while MAv goals have a more negative set of outcomes than MAp goals and a more positive set than PAv goals (Elliot & McGregor, 2001).

Performance

In line with GO theory and research on trait GO (e.g., Dweck & Leggett, 1988; Payne et al., 2007), experimental research into state GO has found that there is a difference between the

various dimensions of state GO in their effect on performance (e.g., Utman, 1997). Generally, inducing mastery goals (i.e., MAp goals) has been found to be beneficial for performance, whereas the results for PAp goals are mixed. However, PAp goals have been associated with higher levels of performance than PAv goals, because PAv goals have been associated with maladaptive patterns of behavior (e.g., Van Yperen et al., 2009). Although research on the inducement of state MAv goals is quite scarce, I assume that MAv goals will show a similar results pattern as PAv goals, because both PAv and MAv goals focus on the possibility of failure, which can lead to threat appraisal, low competence expectancies, and higher levels of anxiety, processes that are detrimental to performance (Baranik et al., 2010). Therefore, I expect MAp goals to be more beneficial to performance than PAp, PAv and MAv goals. Furthermore I expect PAp goals to be more beneficial for performance than PAv and MAv goals.

Motivation

Intrinsic motivation is characterized by the enjoyment of, and interest in an activity itself (Deci & Ryan, 1985). Individuals who set MAp goals are hypothesized to have a higher level of intrinsic motivation, because they focus on the process of the activity and the development of competence resulting in higher levels of excitement (Deci & Ryan, 1991). PAp goals on the other hand are hypothesized to undermine intrinsic motivation, because individuals that set PAp goals engage in achievement activities as a means to an end resulting in perceptions of threat and evaluative pressure (Nicholls, 1984). These feelings of anxiety then undermine intrinsic motivation. As with PAp goals, PAv and MAv goals are also hypothesized to undermine motivation. Because PAv goals emphasize a focus on avoiding to perform worse than others, and MAv goals emphasize a focus on avoiding to lose ability, they produce a strong fear of failure and anxiety (Elliot & Church, 1997; Elliot & McGregor, 2001; Pekrun, Elliot, & Maier, 2009). These emotions then undermine intrinsic motivation.

In line with these predictions, research on the effects of state GO on intrinsic motivation demonstrated that inducing PAp goals has an undermining effect on intrinsic motivation relative to inducing MAp goals (Rawsthorne & Elliot, 1997). The little research that investigated the effect of PAv goals on motivation, has found that PAv goals have a negative effect on motivation (e.g., Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Rawsthorne & Elliot, 1999). Research on the effects of MAv on motivation are less consistent, as some researchers found negative effects of MAv on motivation (e.g., Baranik et al., 2010), whereas other researchers find a lack of a relationship between MAv goals and motivation (e.g., Van Yperen, 2006). Based on the literature and research, I expect MAp goals to be more positively related to intrinsic motivation than PAp, PAv, and MAv, goals.

Self-efficacy

Self-efficacy refers to an individual's perceived capabilities to learn or perform at a certain level and has been shown to influence thought patterns, motivation, and performance (Bandura, 1991). Performance goals (i.e., PAp and PAv goals) are assumed to focus the individual on the demonstration of competence or on avoiding the demonstrating on incompetence. Therefore, the level of self-efficacy depends on the performance levels (Dweck, 1989). MAp goals on the other hand are assumed to focus self-regulatory processes on self-improvement and therefore, are proposed to result in higher levels of self-efficacy. Because MAv goals contain both an adaptive mastery component, and a maladaptive avoidance component, MAv goals should lead to higher levels of self-efficacy than PAv goals, but lower levels of self-efficacy than MAp goals.

Overall, experimental research shows that GO influences the nature of self-regulatory processes. Research has shown that compared to PAp goals, MAp goals lead to higher levels of self-efficacy (e.g., Kozlowski et al., 2001). Research into the effects of induced avoidance goals

on self-efficacy are extremely scarce, but research on the relationship between trait GO and self-efficacy has found that PAv goals are negatively related to task- specific self-efficacy, in contrast to PAp goals who were found to be unrelated to task-specific self- efficacy (Payne et al., 2007). Therefore I expect MAp goals to be more positively related to self-efficacy than PAp, PAv, and MAv goals.

Enjoyment

Intrinsically motivated behaviors are activities that people do out of interest rather than as a means to some end, resulting in feelings of interest, enjoyment, and perceived choice (Deci & Ryan, 1991). Internally controlled behaviors, on the other hand, are activities people do because they feel a pressure to achieve some standard or outcome. These activities usually result in lessened interest, enjoyment, and perceived choice (Ryan, 1982). The focus of MAp goals is on the process of the achievement activity in itself, therefore in line with GO theory, these goals are hypothesized to enhance enjoyment (Dweck & Leggett, 1988). Performance goals (i.e., PAp and PAv goals) on the other hand are focused on the demonstration of competence (or avoiding the demonstration of incompetence) relative to others, resulting in internally controlled behaviors and as a consequence lessened enjoyment. Finally, because MAv goals emphasize a focus on avoiding the loss of ability, the achievement setting can be seen as a threat and the prospect of potential failure is then likely to elicit anxiety and lessened enjoyment.

Most studies on the relationship between emotions and goal orientation have focused on PAp and MAp goals (e.g., Pekrun et al., 2009). Although some studies also examine the relationship between PAv goals and emotions, there is a striking lack of studies that examine the relationship between MAv goals and emotions. Research (e.g., Haraciewicz, Abrahams, & Wageman, 1987; Kolovelonis, Goudas, & Dermitzaki, 2011) on the relationship between state GO and enjoyment did not always confirm the hypothesis that PAp goals would lead to lessened

enjoyment, as they found no differences between MAp goals and PAp goals in their effects on enjoyment. However, others found that MAp goals were positively related to enjoyment (e.g., Barkoukis et al., 2008). In addition to experimental studies, studies on trait GO have also found positive relationships between MAp goals and enjoyment (e.g., Pekrun, Elliot, & Mayer, 2006) and a positive relationship between MAv and PAv goals and negative emotions such as anxiety, shame, and hopelessness (Baranik et al., 2010; Payne et al., 2007; Pekrun et al., 2006). Therefore I expect MAp goals to be more positively related to l enjoyment, in comparison with PAp, PAv, and MAv goals.

Moderators

The literature on the relationship between state GO and its presumed outcomes such as performance and motivation, suggests that the effect of induced state goal orientations varies across studies and depends on the context and the way in which achievement goals are manipulated (e.g., Grant & Dweck, 2003). In addition to examining the direct effects of the four GO's, I aim to demonstrate the conditions under which achievement goal orientations lead to higher levels of performance, motivation, self-efficacy, and enjoyment.

Research on the effects of experimentally manipulated achievement goals on several outcomes such as performance and motivation, generally yields positive effects for MAp goals and negative effects for PAp goals (e.g., Rawsthorne & Elliot, 1999; Utman, 1997). However, these previous meta-analyses have collapsed the findings of individual studies, hereby ignoring the possible differences between different types of manipulations, achievement domains, and goal standards. Although these previous meta-analyses report quite similar patterns of results, they differ in the magnitude of the effect size.

Because of a lack of studies, moderator analyses could not be conducted for the outcomes motivation, self-efficacy, and enjoyment. In previous meta-analyses on GO, moderator analyses

were not conducted for avoidance goals (i.e., MAv and Pav goals), because research on these goals was and still is scarce. Therefore, in the following, I will focus on the moderating role of different variables on the differential relationships between induced state MAp or PAp goals and performance. Moderator variables, including study characteristics (publication status, sample size, research domain, goal framing, and goal standard) and socio-demographic characteristics (age, gender, and nationality) were chosen based on both a theoretical rationale and empirical findings.

Goal Framing

Differences in goal framing may influence the effect of PAp and MAp goals on performance, because goal frames can differ in terms of ambiguity. Goal framing is the manipulation of individuals to adopt a particular GO and can be done in several ways (i.e., goal content, goal climate, or both; Kozlowksi & Bell, 2006). A manipulation of the goal content is an extremely straightforward way of inducing a certain GO; the purpose or focus of the task at hand is quite obvious (Kozlowski & Bell, 2006). The purpose or focus of the task at hand might not be so obvious when the GO is manipulated through the goal climate. Because this type of manipulation aims to influence how individuals approach achievement situations and select goals (Kozlowski & Bell, 2006), it therefore, can be more subject to the individual experience. The effects of goal climate inductions are thus indirect, whereas goal content manipulations shape action directly (Kozlowski & Bell, 2006). Therefore, the effects of inducing GO through the manipulation of the goal climate can result in a smaller effects that might last longer. Therefore, I expect goal content manipulations and manipulations that include both goal content as well as goal climate inductions to result in a greater difference between MAp and PAp goals, compared to goal climate manipulations.

Goal Standards

Achievement goal orientations can differ in their focus; individuals pursuing a MAp goal focus on attaining either a task-referenced standard (e.g., doing well on a task), or a self-referenced standard (e.g., doing better than one has done before; Elliot, Murayama, & Pekrun, 2011). In contrast, individuals pursuing PAp goals focus on attaining an other-referenced standard. This other-based standard can be divided in two components; a self-presentation component and a social comparison component (Elliot, 1999). A self-presentation standard leads individuals pursuing PAp goals to focus on demonstrating their ability, while a social comparison standard leads individuals pursuing PAp goals to focus on doing better than others.

According to Elliot and colleagues (2011), a task-referenced standard is simpler than a self-referenced or an other-referenced standard, because a task-referenced standard merely requires the ability to cognitively represent the task and determine the degree to which one has accomplished the task, while a self-referenced or an other-referenced standard requires additional cognitive capacity to evaluate outcomes. Self-referenced MAp goals are more complicated than task-referenced MAp goals as they require cognitive capacity to represent the task, determine the degree to which one has accomplished the task, and finally evaluate the outcomes by comparing them to earlier outcomes. Regarding PAp goals, pursuing a self-presentation based PAp goal requires cognitive capacity to represent the task, determine the degree to which one has accomplished the task, and finally evaluate the outcomes by comparing them to an earlier (self) set standard. Social comparison based PAp goals require cognitive capacity to represent the task, determine the degree to which one has accomplished the task, evaluate the outcomes by comparing them to an earlier (self) set standard and finally evaluate the outcomes by comparing them to others.

Individuals who set task-referenced goals thus have more cognitive capacity left, which they can use to focus on the task at hand, resulting in higher levels of performance. For example, Elliot and colleagues (2011) have linked task-referenced and self-referenced goals to a different set of consequences. Task-approach goals facilitated intrinsic motivation, learning efficacy, and absorption in class, whereas self-approach goals were unrelated to each of these variables. Therefore, I expect MAp goals framed as task-referenced to produce a greater difference between MAp and PAp goals in their effect on performance, compared to self-referenced MAp goals, because task-referenced MAp goals require less cognitive capacity than self-referenced MAp goals. In addition, I expect no differences in effect sizes between social comparison based PAp goals and self-presentation based PAp goals, because these two PAp standards require the same amount of cognitive capacity.

Achievement Domain

As with domain-specific orientations, state GO's can also vary across different contexts. Structural differences between achievement settings can result in differences in the effect of achievement goals on performance. For example, in the laboratory individuals typically work on novel tasks and therefore actual learning effects are more likely to occur (Giannini, Weinberg, & Jackson, 1988; Ntoumanis et al., 2009), in contrast to educational and sport settings, in which individuals are often familiar with the task at hand. In addition to the novelty of the task, achievement settings can also differ in the complexity of the task at hand. In the educational and sport setting, tasks are usually more complex than tasks in the laboratory (e.g., improving at one's sport and study versus solving puzzles). Therefore, achievement goals are likely to be more difficult to define and achieve in field settings as opposed to laboratory settings and as a result the effects of achievement goals might be bigger in laboratory settings. The effects of inducing MAp or PAp goals might thus be different in the different domains.

Accordingly, research on trait GO has found different effects for MAp and PAp goals in different domains (e.g. Hulleman et al., 2010; Payne et al., 2007). A clear distinction between manipulations of state GO in different achievement domains may therefore, provide more information. Because the tasks at hand in laboratory setting are more novel en less complex, I expect a greater difference between PAp and MAp goals in their effect on performance when these GO's are manipulated in a laboratory setting, as compared with a sport or educational setting.

Study and Sample Characteristics

In addition to goal framing, goal standards and achievement domain, a number of additional moderators of the achievement goal-performance relation were also investigated. These additional moderators were either relevant to current debates in the field of achievement goals (e.g., age, gender), or were typically included in meta-analyses (e.g., nationality, publication status). Age was examined as a categorical variable with two categories: studies in which the participants were under the age of 12 and studies in which the participants were above the age of 12. This distinction was chosen based on the conceptualization of achievement goal orientations of Nicholls (1976, 1978). According to Nicholls, children begin with an undifferentiated conception of ability in which they do not distinguish between ability and effort. Individuals under the age of 12 see ability as something that can increase through hard work and perseverance. This conception of ability changes around the age of 12, when children begin to make a distinction between ability and effort. From that time on, individuals have a more differentiated conception of ability (i.e., ability is a fixed capacity, which does not depend on the effort that is put in) but they can also have an undifferentiated conception of ability (i.e., the more effort you put into something, the more you learn and the more skilled you become). Therefore, it might be that the differences between PAp and MAp goals in their effect on performance can be

accounted for by age, because of the differences in the conceptualization of ability between participants below 12 and above 12.

Method

Literature Search

In order to identify published and unpublished studies containing an experimental manipulation of GO, I conducted a computerized search of the electronic databases of Google Scholar, PsycINFO, PsycArticles, Dissertation Abstracts, and ABI Inform. The following search terms were used: goal achievement, goal orientation, mastery goal, mastery approach goals, performance goals, performance approach goals, performance avoidance goals, mastery avoidance goals, learning goals, learning goal orientation, task goal, task goal orientation, prove goal, prove goal orientation, performance prove goal, performance prove goal orientation, ego goal, ego goal orientation, ability goal, state goal orientation, task involvement, and ego involvement. The databases were subsequently searched for the main authors of the goal orientation literature, including Butler, Chalabaev, Cianci, Cury, Dweck, Elliot, Gully, Harackiewicz, Jagacinski, Koestner, Kozlowski, Nicholls, Sarrazin, Schunk, Van Yperen, and Zuckermann. Third, using the abovementioned terms I conducted a manual search of journals that routinely publish GO articles, including the American Educational Research Journal, Journal of Applied Psychology, Journal of Educational Psychology, Journal of Educational Research, Journal of Personality and Social Psychology, Motivation and Emotion, Learning and Instruction, Human Performance, Personnel Psychology, and Personality and Social Psychology Bulletin. Fourth, I scanned the Society for Industrial and Organizational Psychology and the American Educational Research Association conference programs for unpublished papers between 1980 and 2013. Finally, the reference lists of relevant published (i.e., Rawsthorne & Elliot, 1999;

Utman, 1997) and unpublished meta-analyses (Blaga, manuscript in preparation) were searched. This search yielded 270 articles, which were then reviewed on the inclusion criteria.

Inclusion Criteria

Based on previous meta-analyses (Rawsthorne & Elliot, 1999; Utman, 1997) a number of inclusion criteria were determined to decide which studies to include in the final dataset. First, because the focus of this meta-analysis concerned state GO, the sample was limited to studies that experimentally manipulated or induced state GO as opposed to measuring it. A study was included if it also met the following criteria: (1) the article was written in English and the other inclusion criteria could be checked, (2) the article must be based on the achievement goal orientation theory, (3) a manipulation was included with at least a comparison between a GO condition and a control condition or two GO conditions and participants were randomly assigned to the experimental groups, (4) the study included a performance, motivation, self-efficacy and /or an enjoyment measure, and (5) the study provided sufficient statistical information (N, M, SD, d, t, F, p) to calculate an effect size. This resulted in 177 publications that could not be included in the study due to one or more of the following reasons: (1) the article was not written in English (N = 7), (2) the main subject of the article was goal setting (N = 81), (3) the article was based on trait GO (N = 44), (4) the dependent variable was different than the outcome variables used in this study (N = 21), (5) the required statistical information couldn't be obtained, even after contact with the author (N = 10), and (6) the article was not available, even after contact with the author (N = 14).

The final sample consisted of 73 published articles, 17 dissertations, and three theses, containing 119 studies. Together these studies included 308 effect sizes and 14,984 participants.

Coding of Studies

Based on recent meta-analyses on GO (Hulleman et al., 2010; Payne et al., 2007) each study was coded (if reported) on age, gender, nationality, sample size, effect size, publication status (paper, dissertation, or thesis), research domain (education, work or sports), goal framing (goal content, goal climate or both content and climate), and goal standard (self-referenced versus task-referenced and self-presentation versus social comparison). Each study was coded for the domain in which the GO were manipulated (education, work or sports). Gender was coded as the percentage of men in the study. Age was coded into two categories: 0 = under 12 and 1= above 12. Nationality was coded into three categories: 0 = United States, 1 = Europe, and 2 = other. Publication status was coded into three categories: 0 = paper, 1 = dissertation, and 2 = thesis, goal framing was coded into three categories: 0= goal content, 1= goal climate, and 2 = both goal content as well as goal climate, and finally goal standard was coded into six categories: three categories for Map goals (0 = task- referenced, 1 = self-referenced, and 2 = both task- referenced and self-referenced) and three categories for PAp goals (0 = self-presentation, 1 = social comparison, and 2= both self-presentation and social comparison).

Each study was coded for the abovementioned variables by an undergraduate student and an assistant professor. They coded all studies independently after which meetings were held to review each article and discuss discrepancies, all of which were resolved by consensus.

Statistical Analyses

Main analysis. In a meta-analysis, estimates of effect sizes of different studies are combined in order to try to estimate the true effect size in the population. The effect size index that was used in this study was Cohen's *d*; this is a standardized estimate of the average difference between two groups (Field & Gillett, 2010). For example, the effect size of the MAp versus PAp goal contrast is obtained by extracting the mean of the PAp goal group from the mean

of the MAp goal group and dividing this difference by their pooled standard deviations. A positive value of the d-index indicates better performance when pursuing a MAp goal over a PAp goal, and vice versa for a negative value of the d-index. In order to calculate a global effect size, all effect sizes that were obtained from the studies that were included in the analysis, were weighted by the inverse of the sum of the between-study variance plus within-study variance (Hedges & Vevea, 1998). The more variance a study contained, the smaller the weight that was assigned to the study. Thus, the less reliable studies had a smaller contribution to the analysis, resulting in less bias in the obtained estimate of the population effect size.

There are several meta-analysis techniques (Hedges & Vevea, 1998; Hunter & Schmidt, 2000). The choice for one of these methods depends on the way in which a meta-analysis is conceptualized; according to the fixed-effect model, or the random effects model. The fixed-effects model assumes that the studies in the meta-analysis are a sample from a population with a particular effect size. This effect size is constant for all studies included in the meta-analysis, which means that there is homogeneity in the effect sizes of the studies. The random-effects model assumes that population effect sizes vary randomly between studies and that there is heterogeneity in the effect sizes between studies. Therefore, by taking into account the between-study variance, I followed the random-effects model.

I examined the difference between four GO conditions (namely, PAp, MAp, PAv, and MAv) and one no-goal control condition. Besides the four GO conditions and a no-goal control condition, a number of studies (e.g., Kolovelonis et al., 2011) included a condition in which both PAp and MAp goals were simultaneously induced. In total, five achievement goal conditions (PAp, MAp, PAv, MAv, and MAp/PAp) and a no-goal control condition were identified across the studies. Contrasting each of these six conditions in a pairwise manner resulted in a maximum

of 15 possible goal contrasts. Furthermore, four different outcome measures (i.e., performance, motivation, self-efficacy, and enjoyment) were examined.

An important assumption in a meta-analysis in the independence assumption, which states that a study that is included in a meta-analysis can only contribute one effect size to the analysis. When a study contributes more than one effect size, these effect sizes are likely to be interrelated with each other, thereby affecting the outcomes. Because an effect size was calculated for each comparison, the effect sizes were not always independent of one another. When a study contained more than two conditions or more than one outcome, the effect sizes were interdependent. To guarantee the independence assumption, I carried out separate meta-analyses for each outcome and for each comparison. If a study used multiple trials to examine an outcome measure, the scores of all trials were averaged to obtain one effect size.

Homogeneity test. A homogeneity test was performed to assess the variability in effect sizes of the studies that were included in the analysis. Systematic heterogeneity in the effect sizes indicate that there are potential moderators that can explain this variance. The outcome of this test indicates the probability that the population effect sizes are variable or fixed (Field & Gillett, 2010). If the results of the homogeneity test are not significant, then the effect sizes of the studies are approximately equal and the estimated population effect sizes are likely to be homogeneous. However, if the results of the homogeneity test are significant, then the effect sizes of the studies are not equal to each other, and the estimated population effect sizes are likely to be heterogeneous, as assumed by the random-effects model.

To check whether the effect sizes in the dataset showed heterogeneity, the within-class goodness- of-fit statistic (*Qw*) of the overall effect size was calculated. If this statistic is significant then there is systematic heterogeneity in the effect sizes of the studies. The within-class goodness-of-fit statistic indicates the presence or the absence of heterogeneity, however it

doesn't indicate the degree of heterogeneity. To be able to draw conclusions about the extent of the heterogeneity in a set of effect sizes, I calculated the I^2 index in addition to the within-class goodness-of-fit statistic. The I^2 index represents the percentage of the total variability in a set of effect sizes that can be attributed to between-studies variability. I used Higgins and Thompson's (2002) conventions of $I^2 = 25$, $I^2 = 50$, and $I^2 = 75$ when interpreting heterogeneity as low, medium, and high, respectively. A value of $I^2 = 25$ thus means that 25% of the total variability in the effect sizes can be accounted for by heterogeneity between studies (moderators) and that 75% of this variability can be accounted for by within-study variance.

Moderator analysis. The moderators (i.e., age, gender, nationality, sample size, publication status, research domain, goal framing, and goal standard) were analyzed using meta-regression analyses. Meta-regression is a statistical technique used in a meta-analysis to examine how characteristics of studies are related to variation in effect sizes across studies. This type of analysis is used when more than one predictor or moderator (either continuous or categorical) is included in the analysis. In these analyses, the moderators were included as predictors in a regression model to explain the variance in the effect sizes.

Publication bias analysis. To check if there was publication bias, I constructed a funnel plot. Publication bias refers to the situation in which studies that do not produce a statistically significant result are less likely to be published than those that do produce a statistically significant result. A funnel plot is a graphical representation of the effect sizes of the studies against the standard error of the studies (Field & Gillett, 2010). It assumes that studies with a small standard error will be near the average effect size, and studies with a large standard error will be spread on both sides of this average. Deviation from this assumption can indicate a publication bias. If the sample is not biased, the points in the scatterplot will be symmetrically

spread around the population effect size in the shape of a funnel. All analyses were performed with the Biostat's Comprehensive Meta-Analysis program (Borenstein, Hedges, Higgins, & Rothstein, 2005)

Results

Table 1 displays the number of effect sizes (for each comparison and outcome measure) included in the analysis (*k*), the mean effect sizes (*d*), the estimated standard errors for the effect sizes (*SE*), and the 95% confidence intervals (CIs). By contrasting each of the six conditions (i.e., PAp, MAp, PAv, MAv, MAp/PAp, and no-goal condition) in a pairwise manner, a maximum of 15 possible goal contrasts were possible. However, the number of outcomes measures, and the number of experimental conditions included in a study, varied among the studies. As a result, the number of GO contrasts ranged from 13 for performance to five for enjoyment.

Table 1
The Difference between State Goal Orientation Dimensions on Performance

				95% CI	
Examined relationship	*k*	*d*	*SE*	Lower limit	Upper limit
Performance					
PAp-PAv	17	.39*	.13	.15	.64
PAp-MAv	3	.14	.19	-.24	.51
PAp-MAp/PAp	5	.03	.18	-.32	.37
MAp-PAp	83	.13*	.05	.03	.22
MAp-PAv	14	.51**	.15	.22	.80
MAp-MAv	3	.34	.21	-.07	.76
MAp-MAp/PAp	5	.06	.24	-.40	.52
PAv-MAv	3	.14	.19	-.51	.24
PAp-Control	27	.16	.09	-.01	.33
MAp-Control	29	.39**	.09	.22	.57
PAv-Control	9	.18*	.09	.01	.35
MAv-Control	2	-.21	.24	-.68	.27
MAp/PAp-Control	3	.49**	.15	.20	.78

Note: MAp= mastery approach, PAp= performance approach, MAv= mastery avoidance, PAv= performance avoidance and MAp/PAp= mastery approach and performance approach.
* p <.05; ** p <.001

Outcome Measures

Performance. All goal contrasts followed the expected pattern. The results show that MAp goals led to better performance than PAp goals, $d = .13$, $Z = 2.54$, $p = .01$. In addition, MAp and PAp goals are more beneficial for performance than PAv goals, MAp: $d = .51$, $Z = 3.34$, $p = .001$, and PAp: $d = .39$, $Z = 2.08$, $p = .002$. Finally, subjects in the MAp, PAv, and MAp/PAp performed significantly better than subjects in no-goal control group, MAp: $d = .40$, $Z = 4.59$, $p < .001$, $d = .18$, $Z = 2.08$, PAv: $p =. 04$ and $d = .49$, $Z = 3.32$, and MAp/PAp: $p = .001$. None of the other contrasts were significant (see Table 1).

Motivation. Compared to PAv goals, MAp goals and PAp goals seem beneficial for motivation, MAp: $d = .42$, $Z = 2.59$, $p = .01$ and PAp: $d = .65$, Z = 3.94, $p <.001$. In contrast to my expectations there was no difference between the MAp goal group and the PAp goal group in their levels of motivation. None of the other contrasts were significant (see Table 2).

Table 2
The Difference between State Goal Orientation Dimensions on Motivation

				95% CI	
Examined relationship	*k*	*d*	*SE*	Lower limit	Upper limit
Motivation					
PAp-PAv	4	.66**	.15	.36	.95
PAp-MAp/PAp	2	.23	.17	-.11	.57
MAp-PAp	25	.11	.11	-.10	.33
MAp-PAv	4	.42*	.16	.10	.74
MAp-MAp/PAp	2	-.16	.18	-.51	.18
PAp-Control	2	.31.	.17	-.03	.65
MAp-Control	2	-.10	.17	-.44	.24
MAp/PAp-Control	2	.08	.17	-.25	.42

Note: MAp= mastery approach, PAp= performance approach, MAv= mastery avoidance, PAv= performance avoidance and MAp/PAp= mastery approach and performance approach.
* $p <.05$;** $p <.001$

Self-efficacy. As expected, subjects in the MAp goal conditions reported more self-efficacy than subjects in the PAp goal conditions, $d = .42$, $Z = 2.82$, $p = .01$. None of the other contrasts were significant (see Table 3).

Table 3
The Difference between State Goal Orientation Dimensions on Self-efficacy

Examined relationship	*k*	*d*	*SE*	95% CI Lower limit	95% CI Upper limit
Self-efficacy					
PAp-MAp/PAp	3	.12	.32	-.52	.75
MAp-PAp	20	.48**	.16	.17	.79
MAp-MAP/PAp	3	-.19	.16	-.50	.12
PAp-Control	6	.43	.32	-.19	1.05
MAp/PAp-Control	3	.16	.25	-.33	.64

Note: MAp= mastery approach, PAp= performance approach, MAv= mastery avoidance, PAv= performance avoidance and MAp/PAp= mastery approach and performance approach.
* $p < .05$
** $p < .001$

Enjoyment. The results show that subjects in the MAp and the PAp goal conditions enjoyed their task more than subjects in the control conditions, MAp: $d = .32$, $Z = 4.15$, $p < .001$ and PAp: $d = .55$, $Z = 2.17$, $p = .03$. PAp goals also seem to result in more task enjoyment than PAv goals, $d = .70$, $Z = 2.63$, $p = .01$. None of the other contrasts were significant (see Table 4).

Table 4
The Difference between State Goal Orientation Dimensions on Enjoyment

Examined relationship	*k*	*d*	*SE*	95% CI Lower limit	95% CI Upper limit
Enjoyment					
PAp-PAv	2	.71*	.27	.18	1.23
MAp-PAp	2	.42	.36	-.29	1.12
MAp-PAv	8	-.06	.16	-.38	.26
PAp-Control	2	.55*	.26	.05	1.05
MAp-Control	4	.32*	.08	.17	.47

Note: MAp= mastery approach, PAp= performance approach, MAv= mastery avoidance, PAv= performance avoidance and MAp/PAp= mastery approach and performance approach.
* $p < .05$; ** $p < .001$

Moderators

To test whether variation among studies in effect sizes is associated with differences in study characteristics, meta-regression analyses were conducted. Because of the small number of studies, these analyses could only be performed on the outcome measure performance for the MAp versus PAp contrast. A lack of studies (N = 4) that manipulated MAp goals using both a task-and a self-referenced standard has led to the exclusion of these studies in the moderator analyses for the MAp standard. A lack of studies (N = 6) that manipulated PAp goals using both a self-presentation and a social comparison standard has led to the exclusion of these studies in the moderator analyses for the PAp standard.

Table 5
Moderator Analyses: MAp vs. PAp goals

Moderator	Between class effects		*d*	*95% CI*	*SE*	*Z*	*p*
	Q	*df*					
Age group	8.75	1	-.31	-.05-.17	.11	-2.96	<. 01
Gender	5.28	1	.01	.00-.01	.00	2.30	.02
Nationality	1.35	1	.08	-.06-.22	.07	1.16	.24
Sample size	.57	1	-.00	-.00-.00	.00	-.75	.45
Publication status	.48	1	-.07	-.27-.13	.10	-.70	.49
Research domain	.15	1	.03	-.13-.19	.08	.38	.70
Goal framing	1,33	1	.10	-.07-.28	.09	1.15	.25
LAp standard	0.44	1	.06	-.11-.24	.09	0.66	.51
PAp standard	2.79	1	.13	-.02-.29	.08	1.67	.10

The within-class goodness-of-fit statistic (Qw) was significant for the MAp versus PAp contrast for performance, Q (82) = 373.61, p < .001, I^2 = 78.05, indicating that there were moderators that could account for the large heterogeneity in the effect size. The regression analyses showed that age, and gender were significant moderators (see Figure 1). The results

show that age was a significant moderator, Q (1) = 10.32, p = .001. The difference between MAp goals and PAp goals in their effect on performance was bigger for participants older than 12 years. In addition to age, the percentage of men in a study also moderated the effects of state GO on performance, d = .01, Q (1) = 5.28, p = .02. The difference between MAp goals and PAp goals in their effect on performance became bigger as a study included more men. Neither the goal framing, MAp standard, PAp standard, research domain, sample size, publication status, nor nationality emerged as important moderators of this contrast (see Table 5).

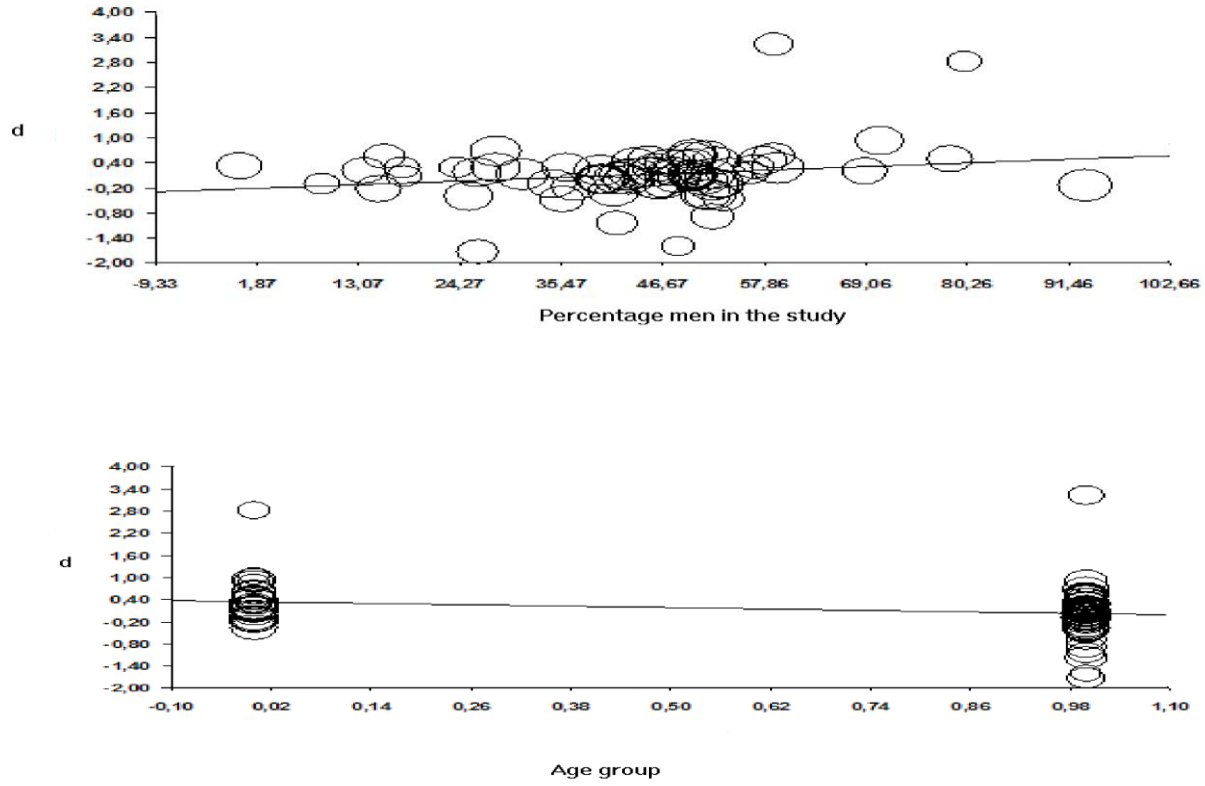

Figure 1. Regression analysis of age group, and gender on the standardized difference between MAp and PAp groups.

Publication Bias

To test whether the results were influenced by a publication bias, a funnel plot was made. The results do not suggest that publication bias played a role in the studies included in this meta-analysis, as the points in the scatterplot are symmetrically spread around the population effect size in the shape of a funnel (see Figure 2). Studies with a small standard error are near the average effect size, and studies with a large standard error are spread on both sides of the average.

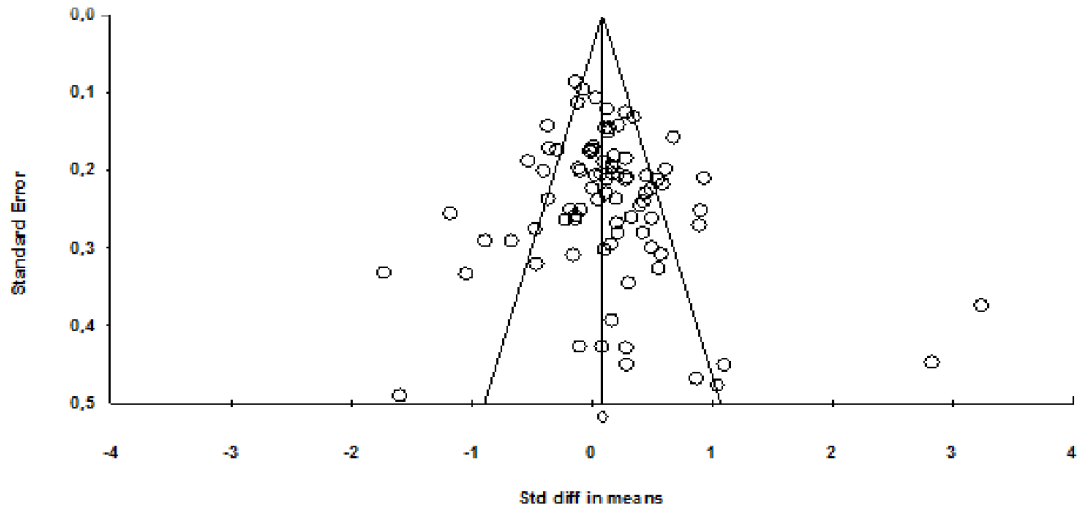

Figure 2. Funnel plot of the standard error by the standard difference in means

Discussion

In this study, the effects of induced state achievement goal orientations (i.e., PAp, MAp, PAv, and MAv goals) on performance, motivation, self-efficacy, and enjoyment were meta-analytically examined. I systematically reviewed 119 studies comprising 14,984 participants, published through 2013, and examined the extent to which conceptual and methodological differences between studies moderated the effects of achievement goal orientations on performance. Whereas some results confirm theory and previously established findings, others do not.

Outcome Measures

One consistent finding of this study was that state MAp goals compared to PAp, PAv, and MAv goals, relate most favorably to performance, motivation, self-efficacy, and enjoyment, across different achievement domains, different achievement goal standards, and a variety of experimental tasks. The beneficial effects of MAp goals in this study are in line with previous meta-analyses on trait GO (Payne et al., 2007) and state GO (Rawsthorne & Elliot, 1999; Utman, 1997), demonstrating the positive effects of MAp goals.

In contrast to my expectations there was no significant difference between the MAp goal group and the PAp goal group in their levels of motivation. In line with the meta-analysis of Rawsthorne and Elliot (1999), I did not found a significant difference between MAp and PAp goals in the levels of enjoyment or motivation. Although the direction and the magnitude of the effect sizes (Motivation: d = .11 and Enjoyment: d = .42) did show a positive trend for the advantage of MAp goals, no conclusion can be drawn based on these results due to the limit number of studies. The results imply that participants in the PAp groups experienced comparable levels of enjoyment and motivation as compared to participants in the MAp goal groups. It seems plausible that individuals pursuing PAp goals gain some pleasure or enjoyment from competing

with others, in particular in sports settings. There was however a significant difference between PAp and PAv goal groups in their effects on motivation and enjoyment. Participants in the PAp goal groups reported higher levels of motivation and enjoyment than participants in the PAv goal groups. In line with the trichotomous framework of GO and in contrast to earlier theories on motivation (e.g., Deci & Ryan, 1991), these findings provide support for the PAp-PAv hypothesis. It is the PAv goal and not the PAp goal that has an undermining effect on enjoyment and motivation. According to Rawsthorne and Elliot (1999), participants pursuing PAp goals focus on the potential for success, which leads to intrinsic motivation levels that are comparable with MAp goals. In contrast with PAp goals, PAv goals create a focus on the potential of failure, which leads to lower levels of motivation and enjoyment. Because MAv goals also focus on the potential of failure, the same patterns of results might occur for MAv goals. However, the lack of studies that induce MAv goals makes it impossible to draw any conclusions.

The Multiple Goal Perspective

The multiple goal perspective (i.e., Barron & Harackiewicz, 2001) states that individuals can pursue both PAp and MAp goals simultaneously. According to this view, both PAp and MAp goals each have independent positive main effects on a given outcome. In contrast to the multiple goal perspective, the results of this study did not support the idea that multiple-goal endorsement is the most adaptive motivational pattern. Individuals in the MAp/PAp condition did not perform better than individuals in the PAp or the MAp goal conditions. However, in contrast with individuals in the MAp goal group, both individuals in the PAp goal group, and individuals in the MAp/PAp goal condition did perform better than individuals in the no-goal control condition.

These results suggest that the simultaneous pursue of both PAp and MAp goals does not have a detrimental effect on performance. A possible explanation for these results could be that the positive effects of multiple goal endorsement are caused by the positive effect of MAp goal

endorsement on performance. This explanation seems plausible as there was no difference between PAp goal groups and no-goal control groups in their levels of performance, while individuals in the MAp/PAp and MAp goal groups did perform better than individuals in the no-goal control groups. However, these contrasts were not examined, therefore no explicit conclusions can be drawn.

In addition, compared to individuals in the PAp and MAp goal conditions, individuals in the MAp/PAp goal condition did not reported higher levels of motivation or self-efficacy. This lack of significant findings may be due the limit number of studies (*N*= 5) that included multiple goal conditions.

I suggest that additional research should address this issue using both person-centered and variable-centered approaches to better understand how patterns of goal orientations may combine to influence achievement.

The Control Condition

Besides contrasting the state GO groups (i.e., PAp, MAp, PAv, MAv, and MAp/PAp groups) with each other, I also compared the effects of GO with a control condition (i.e., general instructions for the task at hand without a specific reference to an achievement GO). Pursuing no specific achievement GO allows individuals to interpret a wide range of performance levels. Goal-setting research (e.g., Latham & Locke, 2007) has shown that, compared to setting vague goals, setting specific goals can benefit performance (Latham & Locke, 2007). The results of this study show that, relative to participants in the no-goal condition, participants in MAp, PAv, and MAp/PAp goal condition showed higher levels of performance. A possible explanation for the finding that individuals in the PAv goal condition performed better than individuals in the no-goal control condition, could be that individuals in the PAv goal condition were concerned with the protection of their self-concept. Because fear of failure is an important antecedent of PAv

goals (Elliot & McGregor), it seems plausible that this fear causes individuals who pursue PAv goals to be highly motivated to perform well in order to protect their self-concept. Individuals in the PAp and MAv goal conditions did not perform better than individuals in the no-goal control condition. A possible explanation for the finding that individuals in the PAp goal condition did not perform better than individuals in the no-goal condition, may lie in the focus that PAp goals provide. PAp goals direct the attention of individuals to others and thus away from the task at hand, as the focus is to outperform others or show one's ability to others. Because PAp goals shift the focus of the individual away from the task, these goals are no better for performance than the vague no-goal control condition.

For the outcomes motivation and self-efficacy, the results show that there were no differences between the specific achievement GO conditions and the no-goal control condition. Individuals in the PAp and MAp goal condition also reported higher levels of enjoyment than individuals in the no-goal control condition. Because PAp goals are positively related to positive achievement emotions (Barron & Harackiewicz, 2001), it seems plausible that individuals in the PAp goal condition experienced some level of pleasure and enjoyment from competing with others, especially in sport settings.

Moderators

I attempted to assess a number of theoretical and exploratory moderators in this study; however, the nature of the data available often prevented a true examination of these variables. Because of a lack of studies, moderator analyses could not be conducted for the outcomes motivation, self-efficacy, and enjoyment. Furthermore, because research on avoidance goals (i.e., PAv and MAv goals) was scarce, I have focused on the differences between MAp and PAp goals in their effect on performance.

Goal Framing. In contrast with my expectations, the results show that there was no significant difference between studies that manipulated the goal content, studies that manipulated goal climate, and studies that manipulated both goal content and climate in their levels of performance. I expected that goal content manipulations and manipulations of both goal content and goal climate would lead to greater differences between MAp and PAp goals in their effect on performance, because goal content manipulations are more straightforward and less susceptible to personal interpretation. The results suggest that the influence of induced state achievement goal orientation does not differ as a function of the goal frame. However, this lack of significance might be due to the limit number of studies. Of the 81 studies included in the moderator analyze, as many as 56 had manipulated the goal climate. Additional research is needed to determine whether the inducement of MAp goals through the goal content or both goal content and climate will lead to greater differences in performance between MAp and PAp goals than the inducement of MAp goals through the goal climate or vice versa.

Goal Standard. In contrast with the ideas of Elliot and colleagues (2011), there were no differences in the effect sizes between the different standards on which the MAp inductions were based. As compared with self-referenced standards, MAp goals framed as task-referenced standards did not elicit a greater difference between MAp and PAp goals when it comes to performance. According to Elliot and colleagues (2011), a task-referenced standard is simpler than a self-referenced, because this type of standard requires the ability to cognitively represent the task, while a self-referenced requires additional cognitive capacity to evaluate outcomes. Inducing task-referenced goals should lead to additional available cognitive capacity, which can be used to focus on the task at hand, resulting in higher levels of performance. However, the results do not support this idea. A possible explanation for this lack of a significant finding might be that task-referenced standards require as much cognitive capacity as self-referenced standards.

In addition to the ability to cognitively represent the task at hand, task-referenced standards also require cognitive capacity to evaluate the degree to which one has accomplished the task and a previously self-set standard. Compared to task-referenced standards, self-referenced standards require cognitive capacity to cognitively represent the task at hand, determine the degree to which one has accomplished the task, and finally evaluate the outcomes by comparing them to earlier outcomes. Thus, task-referenced standards might require as much cognitive capacity as self-referenced standards, which could explain why there were no differences between these two MAp standards in their effect on the MAp goal advantage.

In addition and as expected, there were no differences in the effect sizes between the different standards on which the PAp inductions were based. As compared with self-presentation standards, PAp goals framed as social comparison standards did not elicit a greater difference between MAp and PAp goals when it comes to performance. According to Elliot and colleagues (2011), pursuing a self-presentation based PAp goal requires cognitive capacity to represent the task, determine the degree to which one has accomplished the task, and finally evaluate the outcomes by comparing them to an previously (self) set standard. Social comparison based PAp goals require cognitive capacity to represent the task, determine the degree to which one has accomplished the task and evaluate the outcomes by comparing them to others. These two PAp standards thus require the same amount of cognitive capacity, resulting in comparable levels of performance.

Interpersonal standards (i.e., self-presentation and social comparison standards), can however vary in their complexity as a function of whether the comparison other is concrete and present in the achievement situation or consists of aggregate normative information. A concrete and present interpersonal comparison referent requires the ability to cognitively represent and compare two concrete outcomes, which is only moderately more complex than task-based

comparison (Elliot et al, 2011). In contrast, an aggregate normative comparison referent requires additional cognitive capacity to represent a more abstract evaluative referent. This issue, is however beyond the scope of this study. I suggest that additional research should address this issue by making a clear distinction between concrete and abstract referent when manipulation PAp goals.

Achievement Domain. Contrary to my expectation, the results show that the domain wherein the achievement goals were induced had no significant effect on the relationship between achievement goals and performance. I expected that the difference between MAp and PAp goals would be greater in laboratory settings than in a sports or an educational setting, because the task at hand are novel and less complex in laboratory settings. The results suggest that the influence of induced state achievement goal orientation does not differ as a function of the achievement domain. However, the lack of a significant difference might be due to the lack of variability in the values of this moderator variable. Of the 81 studies included in the moderator analysis, as many as 56 had manipulated achievement goals in a laboratory setting. Another possible explanation for the lack of a significant finding may lie in the type of task that were used in the sport settings. The task that were used in the studies that were conducted in a sport setting, were relatively novel to the participants. For example, the participants in the study of Berebey-Meyer and Kaplan (2005), had to learn how to throw darts. The participants did not have any experiences with this task, they were told and shown all the right techniques how to perform this task as well as possible. The fact that both the tasks of studies conducted in the laboratory and in the sport setting were novel to the participants, makes it hard to find differences between these two types of studies. Additional research is needed to determine whether the inducement of achievement GO in a laboratory setting leads to higher performance levels than the inducement of

achievement goals in a sport or educational setting or whether there truly is no difference between the achievement domains.

Age. The results show that the MAp goal advantage over PAp goals for performance differed as a function of the age group. The MAp goal advantage increases with age, as adolescents showed a greater advantage for MAp goal inductions over PAp goal inductions. The results support the conceptualization of achievement goal orientations of Nicholls (1976, 1978). It seems that there are differences between individuals above and under the age of 12 in their conceptualization of ability.

A possible explanation for this remarkable finding is that adolescents differentiated their achievement goals more clearly than younger children (Bong, 2009). Younger children may lack the capability or, the desire to use interpersonal information to assess their own competence (Bong, 2009). In line with this, Bong (2009) found that young children do not make sufficient distinction between MAp and PAp goals, demonstrated by a high correlation between MAp and PAp goals. This correlation became weaker with an increasing age. The results thus suggests a possible age boundary for the advantage of MAp goals, as younger children benefit less from MAp goals.

Gender. The results showed that the MAp goal advantage over PAp goals for performance differed as a function of gender. The MAp goal advantage increases when more males are included in the study, as studies with more males showed a greater advantage for MAp goal inductions over PAp goal inductions. Research on gender differences in achievement goal orientations are scarce, but the few studies that examined these differences usually find that females tend to pursue mastery goals, whereas men tend to pursue performance goals (Linnenbrink, Ryan, & Pintrich, 2000). Because females naturally set MAp goals, the induction of MAp goals may not have had an exacerbated effect on their performance. These results

contradict the matching hypothesis, suggesting that induced state GO's are most effective when they match the trait GO (Linnenbrink, 2005). In contrast, because males naturally tend to set PAp goals, the induction of MAp goals can compensate for the detrimental effects of their trait PAp goals. These results are in line with the buffering hypothesis, suggesting that induced state GO's are most effective when they contrasts the trait GO (Linnenbrink, 2005). The results of this meta-analysis thus suggest that males may benefit more from MAp goals than females, indicating a possible gender boundary for the advantage of MAp goals.

Limitations

This meta-analysis is not without its limitations. Although I examined several outcomes, there are other consequences of GO that merit additional study. For example, procrastination and affect may be outcomes of state GO, although the outcomes used in this study are the most frequently examined outcomes of state GO (e.g., Payne et al., 2009; Rawsthorne & Elliot, 1999; Utman, 1997). Second, it is unclear how much interdependence of the data is contributing to the outcomes of this study. Because an effect size was calculated for each comparison, the effect sizes weren't always independent of one another. When a study contained more than two conditions, the effect sizes were interdependent. In this study I used meta-analytical techniques to explore the relationships between six conditions, and four outcomes of state GO. By contrasting each of the six conditions in a pairwise manner, a maximum of 15 possible goal contrasts were possible for each outcome, resulting in 60 possible contrasts, whereby each of which was be conducted in a separate analysis. For these types of research design, the preferred analysis to conduct is a multivariate meta-analysis. I have chosen to run separate analyses, because I am only interested in the individual relationships between state GO and the several outcomes and not so much in the relations between the results of state GO. Finally, the variables I examined were limited to those in which there were a sufficient number of studies to meaningfully aggregate.

Directions for Future Research

Although I have established a robust effect of state GO on performance, the data suggested heterogeneity that was not fully accounted for by the moderators I examined. Other potential moderators of the state GO–performance relationships are task characteristics like task complexity (see Utman, 1997) and task demands such as task difficulty and task consistency (see Steele-Johnson et al., 2000). Furthermore, future research should also explore additional moderators of the relationships between state GO and motivation, self-efficacy, and enjoyment.

The little research conducted on MAv goals makes it hard to provide conclusions regarding the effects of MAv goals on their associated outcomes. Further research is needed to draw conclusion about the relationships between MAv goals and outcomes that are associated with it. In addition, while examining the studies that were included in this meta-analysis, I noticed that a majority of the studies did not include a manipulation check. Including a manipulation check is important as this allows a researcher to check whether or not a manipulation was successful. If after a manipulation check, the manipulation proves to be unsuccessful and there are no differences in the outcome between two conditions, the conclusion is there were no differences in the instruction. The lack of a manipulation check on the other hand, might cause a researcher to conclude that the lack of differences between the conditions is due to the fact that state GO doesn’t influence that outcome. Therefore I recommend future research to include a manipulation check when inducing state GO. While examining the studies included in this meta-analysis, I also noticed that the control conditions differ from each other when it comes to the instructions. Some no-goal control conditions included a vague ‘do you best’ instruction, while other no-goal control condition simply included general instructions for the task at hand (without a specific reference to an achievement GO). Future research may make a clear distinction between these two types of control conditions as they may have differential

effects on performance. Finally, while examining the studies included in this meta-analysis, I noticed that studies that experimentally induce GO's only report the differences between the four GO's in their levels of the examined outcomes. The results then indicated whether a particular GO was more or less beneficial than another GO. The nature of these experiment studies thus does not allow for inferences about the relationships between each GO and the examined outcome. Finally, future research on induced state GO may also examine the relationship between each induced state GO and the examined outcome of interest.

The implication for achievement goal theory from the current study is primarily that instructors and employers should encourage the adoption of MAp goals by creating a work-or learning climate that encourages the development of competence, rather than focusing on avoiding mistakes.

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Appendix A

Table A1

Studies Included in the Meta-Analysis and the Corresponding Achievement Goal Manipulations

Study	Task	Goal framing	Goal standard	Manipulations
Avery & Smilie (2013)	Working memory task	Content	MAp: task-referenced PAp: social comparison	MAp: your goal whilst performing this memory task is to get to know the task better by focusing on learning how to detect correct number matches well. Developing your own proficiency on the memory task is the aim of the game! PAp: your goal whilst performing this memory task is to detect as many correct number matches as you can in order to perform better than other students taking part. Being more proficient on the memory task than other students is the aim of the game! Control: Participants were not given any further instructions relating to the purpose of the task.
Barker, McInerney, & Dowson (2002)	Free recall and cued recall tasks	Climate	MAp: self-referenced PAp: self-presentation	MAp: if you concentrate on this task, try to see it as a challenge and enjoy mastering it, you will probably get better as you go along. PAp: people are either good at this activity compared to other kids their age or they are not. Your performance on this activity will tell me something about how good you are at this kind of task.
Barkoukis, Tsorbatzoudis, & Grouios (2008)	PE lessons	Climate	MAp: task-referenced	MAp: the PE teachers were asked to teach using the guidelines of the TARGET intervention program. Control: typical teaching style, in which the teacher makes all the decisions regarding the lesson.
Bell & Kozlowski (2008)	Tandem task	Climate	MAp: task-referenced PAp: self-presentation	MAp: errors are a positive part of the training process" and "you can learn from your mistakes and develop a better understanding of the simulation." Trainees in this condition were encouraged to make and learn from errors during practice. PAp: errors are detrimental to the training process" and that errors would detract from their learning and performance. Trainees in this condition were instructed to avoid errors during practice.
Bereby-Meyer & Kaplan (2005, study 1)	Problem solving task	Climate	MAp: self-referenced PAp: self-presentation and social comparison	MAp: the participants were told that they would play a game that will teach them things, will improve their ability and skills, and that these skills are important in school. They were also told that in this game the idea is to learn from mistakesin order to improve their ability. PAp: the participants were told that the aim of the game is to compare the ability of different participants in playing the game. They were told that most participants who played this game failed to reach the solution, but a few participants were very good and that they had an opportunity to show that they were good in playing the game. Control: the participants received no explicit priming instructions, but were simply told that they would be playing a game.
Bereby-Meyer & Kaplan (2005, study 2)	Problem solving task	Climate	MAp: self-referenced PAp: self-presentation and social comparison	MAp: the participants were told that they would play a game that will teach them things, will improve their ability and skills, and that these skills are important in school. They were also told that in this game the idea is to learn from mistakes in order to improve their ability. PAp: the participants were told that the aim of the game is to compare the ability of different participants in playing the game. They were told that most participants who played this game failed to reach the solution, but a few participants were very good and that they had an opportunity to show that they were good in playing the game. Control: the participants received no explicit priming instructions, but were simply told that they would be playing a game.

Bergin (1995)	Reading task	Climate	MAp: task- referenced PAp: social comparison	MAp: the purpose of this study is to investigate how college students learn from text. We would like you to study the following reading passage in such a way that you could use it in your own teaching and so that you could also explain it to another person. We would like you to study this passage as though you were really trying to learn the material so you could use it. PAp: The purpose of this study is to investigate how college students learn from text. We will administer a series of questions on Thursday that will allow us to rank you in terms of your ability on this type of task. We want to know who is best and who is worst at learning and remembering from this type of reading. We would like you to study this passage as though you were trying to beat all the other students in the class.
Bjørnebekk, Gjesme, & Ulrikson (2011, study 1)	Problem solving task	Climate	MAp: task- and self-referenced PAp: social comparison	MAp: the problems you have the opportunity to answer today were constructed in a way which will allow you to discover new ways and strategies to solve them if you are working carefully on them. What we are interested in is how much you improve your skills by working with this type of problem. When you have finished, you will have the opportunity to learn whether you did well and made progress toward mastering these tasks. PAp: the problems you have the opportunity to answer today were constructed in a way which will allow you to compare your results with others. What we are interested in is how well you perform on the tasks as compared with other sixth-graders. When you have finished, you will have the opportunity to know how well you performed compared with others.
Bjørnebekk, Gjesme, & Ulrikson (2011, study 2)	Problem solving task	Climate	MAp: task-referenced PAp: self-presentation and social comparison	MAp: the purpose of this study is to collect data on sixth-graders' reactions to the problems. The session will provide you with the opportunity to get to know these problems and learn how to solve the problems well. You will be informed whether you learned how to solve the problems well. PAp: the purpose of this study is to compare sixth-graders with one another in their ability to solve these problems. Previous work had indicated that most sixth-graders are fairly similar in their ability to solve problems but that some students stand out because they do it exceptionally well. Thus, the problem-solving session will provide the opportunity ''to demonstrate that you are an exceptional problem solver.'' You will be informed whether you did well compared with others. PAv: the purpose of this study is to compare sixth-graders with one another in their ability to solve these problems. They were told that previous tests had indicated that most sixth-graders are fairly similar in their ability to solve problems, but that some pupils stand out because they do so poorly. Thus, the session would provide some insight into whether they were a poor problem-solver. You will be informed whether you did poorly compared with others.
Bodmann (2008, study 3)†	MC test	Content and climate	MAp: task- referenced PAp: social comparison	MAp: participant were asked to approach the task the same way they would when trying to learn as much as possible in one of their classes and that the computer would give them feedback about how much they learned. They were also told that previous research has identified different type of goals, what mastery goals were and that they should adopt a mastery goal for this task. PAp: participant were asked to approach the task the same way they would when trying to do well on an exam in one of their classes and that the computer would give them feedback about how well they did compared to others. They were also told that previous research has identified different type of goals, what performance goals were and that they should adopt a performance goal for this task. Control: participant were told that they would be giving short answers and MC tests. The computer would provide feedback about the number of questions they answered correctly
Bodmann (2008, study 4)†	Problem solving task	Content and climate	MAp: task- referenced PAp: social comparison	MAp: participant were asked to approach the task the same way they would when trying to learn as much as possible in one of their classes and that the computer would give them feedback about how much they learned. They were also told that previous research has identified different type of goals, what mastery goals were and that they should adopt a mastery goal for this task. PAp: participant were asked to approach the task the same way they would when

				trying to do well on an exam in one of their classes and that the computer would give them feedback about how well they did compared to others. Control: participant were told that the computer would provide feedback about the number of questions they answered correctly. They were also told that previous research has identified different type of goals, what performance goals were and that they should adopt a performance goal for this task.
Bouffard, Bouchard, Goulet, Denoncourt, & Couture (2005)	Problem solving task	Climate	MAp: self-referenced PAp: self-presentation	MAp: working carefully on problems will allow you to discover new ways and strategies as to how solve them. You may encounter difficulties during the solving process, but this is usual and normal. The very important thing is to do your best since this will lead you to improve your vocabulary and comprehension skills which could be useful for your learning in class. PAp: since the performance on this task is linked to verbal IQ, working carefully on problems will allow you to have information about your verbal competence. You may encounter difficulties during the solving process, but this is usual and normal. The very important thing is to do your best since this will lead you to get information about your verbal IQ.
*Butler (1987)	Problem solving and a divergent thinking task	Climate	MAp: task-referenced PAp: self-presentation	MAp: you thought of quite a few ideas; maybe it is possible to think of more different ideas." And "You thought of quite a few different ideas; maybe it is possible to think of more unusual, original ideas. PAp: participants received final performance scores, including those of average ability. Control: participants received no evaluation.
Butler (1988)	Problem solving task and a divergent thinking task	Climate	MAp: task-referenced PAp: social comparison MAp/PAp: task-referenced and social comparison	MAp: participants were told that they had been given an appropriated comment on their performance. PAp: pupils were told that each had been given a grade which indicated how they had done relative to other pupils in the class. MAp/PAp: participants were given both comment and a grade.
Butler (1992)	Participants were asked to create pictures from a page of empty circles.	Climate	MAp: task-referenced PAp: self-presentation	MAp: we know that everyone is capable of being imaginative and creative, but does not always have the chance to express these capacities. We have developed a task which can help you express your imagination, and development ways of looking at ever day things. There are no right or wrong pictures; try and think of complex and different pictures, which reflect your own special way of looking at things. PAp: we know that students differ in their creative ability. Before you is a test of creative ability. Studies have shown that students who do well on this test are more creative than ones who do poorly. Try to do the test as well as you can. There are no right or wrong pictures; success on the test depends on the number of complex and different pictures drawn.
Butler (1993, study 1)	Water jar problems	Climate	MAp: self-referenced PAp: self-presentation	MAp: the problems before you do not require prior skills. They have been constructed to enable you to develop proficiency and to learn and refine problem-solving strategies on a novel task. PAp: the problems before you test analytic thinking and problem-solving. Problems like these appear on IQ tests and university entrance exams because success on them is correlated with academic ability.
Butler (1993, study 2)	Water jar problems	Climate	MAp: self-referenced PAp: self-presentation	MAp: Analytic thinking skills are an important component of much academic activity. The tasks before you provide an opportunity to apply logical problem-solving skills, to modify ineffective strategies where necessary; and thus to develop and refine optimal strategies as you go along. PAp: Academic success depends in large part on the quality of one's analytic thinking. The tasks before you are a valid test of analytic problem-solving, which includes the ability to modify ineffective strategies where necessary. University students should do well on them.
Butler (1995, study 2)	Participants were asked to create pictures from a page of empty circles.	Climate	MAp: task-referenced PAp: social comparison	MAp: we know that everyone is capable of being imaginative and creative, but does not always have the chance to express these capacities. We have developed a task which can help you express your imagination, and development ways of

				looking at everyday things. There are no right or wrong pictures; try and draw a lot of pictures, including complex ones. PAp: this task measures creative ability. We know that participants differ in their creative ability. Participants who do well on this task are more creative than ones who do poorly. Try to do the test as well as you can. There are no right or wrong pictures; success on the test depends on the number of complex pictures drawn. Later I shall be collecting the tasks to see who did best.
Butler (1999, study 1)	Water jar problems	Climate	MAp: self-referenced PAp: self-presentation	MAp: in school one learns how to think and solve problems. These tasks give you an opportunity to try out your problem-solving skills, to see if your using effective methods and to develop and improve your thinking and methods as you go along. PAp: success in school depends on your ability to think and solve problems, to see if you are using good methods, and to use better methods if necessary. Some participants have better ability than others. These tasks test how good you are at thinking and solving problems. Students of your age should do good on them.
*Butler (1999, study 2)	Water jar problems	Climate	MAp: self-referenced PAp: self-presentation	MAp: in school one learns how to think and solve problems. These tasks give you an opportunity to try out your problem-solving skills, to see if your using effective methods and to develop and improve your thinking and methods as you go along. PAp: success in school depends on your ability to think and solve problems, to see if you are using good methods, and to use better methods if necessary. Some participants have better ability than others. These tasks test how good you are at thinking and solving problems. Students of your age should do good on them.
*Chalabaev, Major, Cury, & Sarrazin (2009)	Problem-solving task	Climate	PAp: self-presentation PAv: self-presentation	PAp: the particular test you will be taking today is designed to help us identify people who are exceptionally strong in their problem-solving reasoning abilities. Your performance on this test will not be scored like most normal tests, but rather will be classified as either above or below a predetermined cutoff score. If you score above the cutoff score, this suggests that you are exceptionally strong—in other words, well above average in your problem-solving reasoning abilities. However, scoring below the cutoff score tells us little or nothing about your problem-solving abilities and potential. You may be below average, average, or even above average. Thus, this test and the scoring method used with it are designed only to separate those who are especially strong from everyone else. PAv: the particular test you will be taking today is designed to help us identify people who are exceptionally weak in their problem-solving reasoning abilities. Your performance on this test will not be scored like most normal tests, but rather will be classified as either above or below a predetermined cutoff score. If you score below the cutoff score, this suggests that you are exceptionally weak —in other words, well below average in your problem-solving reasoning abilities. However, scoring above the cutoff score tells us little or nothing about your problem-solving abilities and potential. You may be below average, average, or even above average. Thus, this test and the scoring method used with it are designed only to separate those who are especially weak from everyone else.
*Chalabaev, Major, Cury, & Sarrazin (2012, study 1)	Math word problems	Climate	PAp: social comparison PAv: social comparison	PAp: participants heard that a scoring method would be used to identify students who had strong math or problem-solving ability. These instructions referred to competence relative to others, by informing participants that their performance on the math test would be compared to the performance of other university students. PAv: participants heard that a scoring method would be used to identify students who had weak math or problem-solving ability. These instructions referred to competence relative to others, by informing participants that their performance on the math test would be compared to the performance of other university students. Control: no information about interpersonal comparisons and the scoring method was mentioned.
*Chalabaev, Major, Cury, & Sarrazin (2012, study 2)	Math word problems	Climate	PAp: social comparison PAv: social comparison	PAp: participants heard that a scoring method would be used to identify students who had strong math or problem-solving ability. these instructions referred to competence relative to others, by informing participants that their performance on the math test would be compared to the performance of other university students. PAv: participants heard that a scoring method would be used to identify students who had weak math or problem-solving ability. These instructions referred to

				competence relative to others, by informing participants that their performance on the math test would be compared to the performance of other university students. Control: no information about interpersonal comparisons and the scoring method was mentioned.
*Chasteneuf (2005)	Problem solving task	Climate	MAp: self-referenced PAp: social comparison	MAp: many people make mistakes on these puzzles in the beginning but get better as they go along. When people see the puzzle as a challenge, it makes them try harder and have more fun along the way. The reading task is a lot like that. If you concentrate on the task, try to see it as a challenge and enjoy mastering it, you will get better as you go along. PAp: manipulation through feedback. From how you did on the puzzles, I have a pretty good idea of how good you are at this type of problem-solving compared to other people your age. The reading activity is a lot like that in that people are either good at it compared to other people their age or they are not. So how you did on the puzzle activity tells me something about how well you will do on the reading activity compared to other people your age. Control: Subject completed the puzzle-solving task and were given no feedback but were given procedural information on the experimental task.
Chen & Mathieu (2008)	Logical thinking task	Climate	MAp: task-referenced PAp: self-presentation	MAp: research has demonstrated that the performance on this task sharpens the mind and learning to do it well could help academic studies. While performing this task, you will probably make a bunch of mistakes, get a little confused, maybe feel a little dumb at times—but eventually you will learn some useful things. PAp: research has demonstrated that your performance on this task is an accurate representation of your ability on these kinds of tasks. While performing this task, you should work hard and concentrate on scoring as well as you can.
*Chia (1995)	Participants had to predict stock prices	Climate	MAp: task-referenced and self-referenced PAp: self-presentation	MAp: participant were told that the purpose of the task was to enable them to learn about predicting stock prices. Participants were told to treat this task as an opportunity for learning and self-improvement. They should take advantage of the task to learn as much as they can, and to develop their knowledge, skills, and abilities to the fullest. PAp: participants were told that the purpose of the task was to allow them to prove their ability at predicting stock prices. Participants were told to treat this task as an opportunity to assess how good they are at predicting stock prices. They should take advantage of the task to see whether they have all the knowledge, skills, and abilities necessary to do well at this task. Control: the manipulation statements corresponding to the treatment factor were not included.
Cianci, Klein, & Seijts (2010)	Comprehension and analogy questions.	Climate	MAp: task- and self-referenced PAp: self-presentation	MAp: your goal throughout the next task is to learn how to approach the task as well as possible. You should view this as an opportunity to learn and develop your ability to perform this task. The process by which you learn to do and understand the task should be your concern, as you may be asked to show a younger student how to approach the task. PAp: your goal throughout the next task is to perform as well as possible, achieving the highest score possible. You should view this as an opportunity to demonstrate your ability to perform this task. Your absolute level of performance should be your concern in that it tests your intellectual ability.
Cianci, Schaubroeck, & Mc Gill (2010, study 1)	Comprehension and analogy questions	Content and climate	MAp: task- and self-referenced PAp: self-presentation	MAp: your goal throughout the next task is to learn how to approach the task as well as possible. You should view this as an opportunity to learn and develop your ability to perform this task. The process by which you learn to do and understand the task should be your concern, as you may be asked to show a younger student how to approach the task. PAp: your goal throughout the next task is to perform as well as possible, achieving the highest score possible. You should view this as an opportunity to demonstrate your ability to perform this task. Your absolute level of performance should be your concern in that it tests your intellectual ability. Control: please complete the following task based on the instructions in each section.

Cianci, Schaubroeck, & Mc Gill (2010, study 2)	Comprehension and analogy questions	Content and climate	MAp: task- and self-referenced PAp: self-presentation	MAp: your goal throughout the next task is to learn how to approach the task as well as possible. You should view this as an opportunity to learn and develop your ability to perform this task. The process by which you learn to do and understand the task should be your concern, as you may be asked to show a younger student how to approach the task. PAp: your goal throughout the next task is to perform as well as possible, achieving the highest score possible. You should view this as an opportunity to demonstrate your ability to perform this task. Your absolute level of performance should be your concern in that it tests your intellectual ability. Control: please complete the following task based on the instructions in each section.
*Chillarege, Nordstrom, & Williams (2003)	Microsoft Word software training sessions	Content and climate	MAp: task-and self-referenced PAp: social comparison MAv: self-referenced PAv: social comparison	MAp: instructions emphasized that the trainee's goal was computer mastery and individual improvement. Moreover, the instructions stressed the benefits of making errors and presented trainees with four heuristics to help them cope with errors. PAp: instructions stressed that the trainee's goal was to demonstrate high performance relative to other trainees and also mentioned that computer performance was diagnostic of intellectual ability. The instructions further informed trainees of the benefits of making errors and presented the four heuristics. MAv: instructions again emphasized skill mastery and individual improvement but stressed that errors inhibit learning and were to be avoided during training. PAv: instructions again stressed maximum performance relative to other trainees. The instructions noted that acquiring computer knowledge is diagnostic of intellectual ability. Additionally, trainees were told that errors inhibit learning and are best avoided.
Conti, Amabile, & Pollak (1995)	Creative task or a word-substituting task	Climate	PAp: self-presentation MAp/PAp: self-presentation	MAp: we are interested in students' ideas about the material, our pretesting has shown that the material was quite interesting. After the reading, you will be asked for your reactions to it. PAp: We are interested in students' performance on tests of this type of material and our pretesting showed test scores correlate highly with introductory psychology grades. You will be taking a test after the reading and you will be informed of your score before you leave the experimental session. MAp/PAp: Although we are interested in students' test performance, we are most interested in their ideas about the material. This instruction was followed by the task-focused directions and then the test-focused directions.
Convington & Omelich (1984)	MC midterm exam	Climate	MAp: task-referenced PAp: social comparison	MAp: any number of students could achieve a given letter grade on each test as long as they all met preannounced criteria in the form of items correct. PAp: your individual performances will be evaluated relative to the performance of your group on each test.
Copley (1991)†	Problem solving task	Climate	MAp: task-referenced PAp: self-presentation	MAp: I will be watching you solve the problem of ALGERNON. People who study computers have discovered that people who learn how to get the mouse to the cheese can better work with computers. I don't care how many mistakes you make or how many times you hit the wall or miss the cheese. I just want you to learn everything you can learn about how to tell the computer what to do. Enjoy! PAp: I will be watching you solve the problem of ALGERNON. You will receive pints for correct ALGERNON moves. Remember you are trying to get the mouse to the cheese without crashing or running out of moves. I will give you 100 points every time the mouse gets to the cheese. I will take 25 points away every time you crash into the wall. I will take 10 points away every time you starve the mouse to death. I am very interested in your score. I hope you do well.
*Cramer (2000)†	Physical education	Climate	MAp: self-referenced PAp: self-presentation	MAp: the motivational climate was manipulated to emphasize a task goal orientation. PAp: the motivational climate was manipulated to emphasize an ego goal orientation.

Crouzevialle & Butera (2012, study 1)	Problem solving task	Climate	PAp: not specified	PAp: participants had to judge the spatial location of 20 words related to performance-approach goals. Control: for the participants, words were all neutral regarding performance- approach goals.
Crouzevialle & Butera (2012, study 2)	Problem solving task	Climate	PAp: self-presentation and social comparison	PAp: during the recorded part of the task, the experimenters will assess your performance. It is important for you to be proficient, to perform well and to obtain a high score, in order to demonstrate your competence. You should know that a lot of students will do this task. You are asked to keep in mind that you should try to distinguish yourself positively, that is, to perform better than the majority of students. In other words, what we ask you here is to show your competencies, your abilities. Control: participants were simply informed that they were going to be performing another set of problems and that their performance would now be recorded.
Crouzevialle & Butera (2012, study 3)	Problem solving task	Climate	PAp: self-presentation and social comparison	PAp: during the recorded part of the task, the experimenters will assess your performance. It is important for you to be proficient, to perform well and to obtain a high score, in order to demonstrate your competence. You should know that a lot of students will do this task. You are asked to keep in mind that you should try to distinguish yourself positively, that is, to perform better than the majority of students. In other words, what we ask you here is to show your competencies, your abilities. Control: participants were simply informed that they were going to be performing another set of problems and that their performance would now be recorded.
Cury, Elliot, Sarrazin, Da Fonseca & Rufo (2002)	Basketball dribbling activity	Climate	MAp: task- and self-referenced PAp: self-presentation and social comparison PAv: self-presentation and social comparison	MAp: this research is being conducted in collaboration with the French basketball Federation in order to better understand how teenage students play basketball. This course has been set up and used all over France. The aim of this session is to see if you can quickly improve your dribbling. There are two trials and the object is to go as fast as possible. When you have finished your two attempts, you will be provided with information regarding your time taken to complete the course. PAp: this course has been set up and used all over France in order to identify and select the students at each school with the best dribbling. You will be videotaped and the tape of the students with the best times will be shown to the other students at your school. There are two trials and the object is to try to go as fast as possible. If your performance is better than a majority of students, you will demonstrate that you have a good technical level of dribbling. PAv: this research is being conducted in collaboration with the French Basketball Federation in order to better understand how teenage students play basketball. The intention is to compare French students to one another on their technical level of dribbling, which is estimated by their time taken to complete the course. This course has been set up and used all over France in order to identify students' most important errors in dribbling. You will be videotaped and the tape of the students with the worst times will be shown to the other students at your school so they can see the errors to avoid. There are two trials and the object is to try to go as fast as possible. If your performance is worse than a majority of students, you will demonstrate that you have a poor technical level of dribbling. When you have finished your two attempts, you will be provided with information regarding your time taken to complete the course and how you performed compared to other students.
*Darnon, Butera, & Harackiewicz (2007)	MC test	Climate	MAp: self-referenced PAp: self-presentation	MAp: it is very important for you to accurately understand the aims of this experiment. You are here to acquire new knowledge that could be useful to you, to understand correctly the experiments and the ideas developed in the text, and to discover new concepts. In other words, you are here to learn. PAp: It is very important for you to accurately understand the aims of this experiment. You are here to perform, to be good, to get a good grade on the Multiple Choice Test, to prove your abilities, and to show your competencies. Experimenters will evaluate your performance. This evaluation has to be as good as possible. Control: no specific instructions were given.

Darnon, Harackiewicz, Butera, Mugny, & Quiamzade (2007, study 1)	MC test	Content	PAp: self-presentation and social comparison PAv: social comparison	PAp: the experimenters will evaluate your performance. It is important for you to perform well and obtain a good grade on the different tasks presented here. You should know that a lot of students will do this task. You are asked to keep in mind that you should try to distinguish yourself positively, that is, to perform better than the majority of students. In other words, what we ask you here is to show your competencies, your abilities. PAv: the experimenters will evaluate your performance. It is important for you to avoid performing poorly and not obtain a bad grade on the different tasks presented here. You should know that a lot of students will do this task. You are asked to keep in mind that you should try not to distinguish yourself negatively, that is, try not to perform more poorly than the majority of students. In other words, what we ask you here is to avoid performing poorly. Control: no specific instructions were given.
Dickhäuser, Buch, & Dickhäuser (2011)	Verbal analogies task	Content	MAp: self-referenced PAp: self-presentation and social comparison PAv: social comparison	MAp: the sets of problems we use provide the possibility to develop problem-solving skills. The purpose of this project is to give students the opportunity to develop their problem-solving skills. If you practice, you can train your ability in solving complex problems. Hence, we want to discover how students develop their competence in problem solving. PAp: the sets of problems are from intelligence tests. The purpose of this project is to compare students to one another in their abilities to solve anagrams. In numerous studies, we have found that university students are comparable in their abilities to solve anagrams, but some students stand out as they do quite well on the anagrams. This session will give you the opportunity to demonstrate that you are a good anagram solver. Hence, we want to discover whether you do better than other students. PAv: the sets of problems are from intelligence tests. The purpose of this project is to compare students to one another in their abilities to solve anagrams. In numerous studies, we have found that university students are comparable in their abilities to solve anagrams, but some students stand out as they do quite poorly on the anagrams. This session will give you the opportunity to demonstrate that you are not a bad anagram solver. Hence, we want to discover whether you do worse than other students.
Edwards†	Reading task and answering questions about a text	Climate en content	MAp: task- referenced PAp: self-presentation PAv: self-presentation	MAP: this session will provide you the opportunity to learn how the brain regulates emotions. When you have completed the study, you will be provided information regarding how well you learned about how the brain regulates emotions. Remember your goal is to learn how the brain regulates emotions. Please read the passage with your goal in mind. PAp: this session will give you the opportunity to demonstrate that you are exceptional at answering questions about the text you are about to read. When you have completed the study, you will be provided information regarding how well you did compared to the other students. Remember your goal is to demonstrate that you are exceptional at answering the short answer questions about the passage. Please read the passage with your goal in mind. PAv: This session will give you the opportunity to demonstrate that you are not extremely poor at answering questions about the text you are about to read. When you have completed the study, you will be provided information on whether you did poorly compared to other students. Remember your goal is to demonstrate that you are not extremely poor at answering the short answer questions about the passage. Please read the passage with your goal in mind. Control: when you have completed the study, you will be provided your score on the test. Remember your goal is to read a cognitive neuroscience passage on the computer. Please read the passage with your goal in mind.
*Elliot, Cury, Fryer, & Huguet (2006)	Basketball dribbling activity	Climate	MAp: self-referenced PAp: self-presentation PAv: self-presentation	MAp: this research is being conducted in collaboration with the French Basketball League in order to better understand how students play basketball. The intention is to determine the teaching quality of the dribbling course to see if it can be used to examine students' progress in dribbling ability. This course has been set up and used all over France. The first aim of this session is to see if you can quickly improve your dribbling. PAp: this course has been set up and used all over France in order to identify

				students at each school who do the best dribbling. You will be videotaped and the tape of the students with the best times will be shown to the other students at your school. PAv: this course has been set up and used all over France in order to identify students' most important errors in dribbling. You will be videotaped and the tape of the students with the worst times will be shown to the other students at your school so they can see the errors to avoid.
Elliot & Dweck (1988)	Problem solving task	Climate	MAp: self-referenced PAp: self-presentation	MAp: if you pick the task in this box, you'll probably learn a lot of new things. But you'll probably make a bunch of mistakes, get a little confused, maybe feel a little dumb at times—but eventually you'll learn some useful things. PAp: in this box we have problems of different levels. Some are hard, some are easier. If you pick this box, although you won't learn new things, it will really show me what kids can do.
Elliott & Harackiewitz (1996, study 1)	Nina puzzles	Climate	MAp: task- referenced PAp: self-presentation PAv: self-presentation	MAp: the purpose of this project is to collect data on college students' reactions to hidden figure puzzles--specifically, our Nina puzzles. When you have completed the four puzzles, you will be provided with information regarding the percentage of the total hidden Nina's that you found in today's session. PAp: the purpose of this project is to compare college students to one another in their ability to solve hidden figure puzzles--specifically, our Nina puzzles. In our previous work, we have found that most students are fairly comparable in their ability to solve Nina puzzles, but some students stand out because they do quite well on the puzzles. This session will give you the opportunity to demonstrate that you are a good puzzle solver. PAv: the purpose of this project is to compare college students to one another in their ability to solve hidden figure puzzles--specifically, our Nina puzzles. In our previous work, we have found that most students are fairly comparable in their ability to solve Nina puzzles, but some students stand out because they do quite poorly on the puzzles. This session will give you the opportunity to demonstrate that you are not a poor puzzle solver.
Elliott & Harackiewitz (1996, study 2	Nina puzzles	Climate	MAp: task- referenced PAp: self-presentation PAv: self-presentation	MAp: the purpose of this project is to collect data on college students' reactions to hidden figure puzzles--specifically, our Nina puzzles. When you have completed the four puzzles, you will be provided with information regarding the percentage of the total hidden Nina's that you found in today's session. PAp: the purpose of this project is to compare college students to one another in their ability to solve hidden figure puzzles—specifically, our Nina puzzles. Your performance in today's session will show your level of puzzle solving ability. PAv: the purpose of this project is to compare college students to one another in their ability to solve hidden figure puzzles—specifically, our Nina puzzles. Your performance in today's session will show your level of puzzle solving ability.
Elliott, Shell, Henry, & Maier (2005, study 1A)	Problem solving task	Climate	MAp: task-referenced PAp: self-presentation PAv: self-presentation	MAp: the purpose of this study is to collect data on high school students' reactions to the problems." They were additionally told that the session would provide them with the opportunity to "get to know these problems and learn how to solve them well. PAp: the purpose of this study is to compare high school students with one another in their ability to solve these problem. Previous work has indicated that most high school students are fairly comparable in their ability to solve the problems but that some students stand out because they do exceptionally well. Thus, the session would provide the opportunity to demonstrate that you are an exceptional problem solver. PAv: the purpose of this study is to compare high school students with one another in their ability to solve these problem. Previous work has indicated that most high school students are fairly comparable in their ability to solve the problems, but that some students stand out because they do so poorly. Thus, the session would provide the opportunity to demonstrate that you are not a poor problem solver.
Elliott, Shell, Henry, & Maier (2005, study 1B)	Problem solving task	Climate	MAp: task-referenced PAp: self-presentation	MAp: the purpose of this study is to collect data on high school students' reactions to the problems." They were additionally told that the session would

			PAv: self-presentation	provide them with the opportunity to get to know these problems and learn how to solve them well. PAp: the purpose of this study is to compare high school students with one another in their ability to solve these problem. Previous work has indicated that most high school students are fairly comparable in their ability to solve the problems but that some students stand out because they do exceptionally well. Thus, the session would provide the opportunity to demonstrate that you are an exceptional problem solver. MAv: the purpose of this study is to compare high school students with one another in their ability to solve these problem. Previous work has indicated that most high school students are fairly comparable in their ability to solve the problems, but that some students stand out because they do so poorly. Thus, the session would provide the opportunity to demonstrate that you are not a poor problem solver.
Elliott, Shell, Henry, & Maier (2005, study 2)	Lexically based activity similar to the game Scrabble.	Climate	MAp: task-referenced PAp: self-presentation	MAp: the purpose of this study is to collect data on college students' reactions to this game. They were then told that the object of the session was to learn how to play this game well. PAp: the purpose of this study is to compare college students with one another in their ability to solve these puzzles. Previous work has indicated that most college students are fairly comparable in their ability to solve puzzles but that some students stand out because they do exceptionally well. Thus, the session would provide the opportunity to demonstrate that you are an exceptional puzzle solver.
Erdley, Cain, Loomis, Dumas-Hines (1997, study 1)	Letter writing	Climate	MAp: self-referenced PAp: self-presentation	MAp: the important thing is, this will give you a chance to practice and improve your ways of making friends. So think of it as a chance to work on your skills and maybe learn some new ones. PAp: the important thing is, we'd like to see how good you are at making friends. Think of it as a chance for you to see how good you are at making friends too.
Escribe & Huet (2005)	Free recall task	Climate	MAp: self-referenced PAp: self-presentation and social comparison	MAp: this task is a means of developing your own competencies and methods of study. This is an opportunity for you to train and improve your way of learning. PAp: this task is a test to measure your memory capacity. At the end of the experiment, we will collectively tell you what is your level and how you compared to the others.
Gano-Overway (2001)†	The participants had to press the left mouse button whenever a blue dot appeared on the computer screen.	Climate	MAp: self-referenced PAp: social comparison	MAP: this task tests how good you are at responding quickly to situations. Many people show slow reactions at first but with more practice, they begin to show improvements in their reaction time. The purpose of this project is to see if by doing this task people can learn to improve their reaction time. So as you perform this task, we would like you to focus on improving your reaction time score over the course of several attempts at the task. There is no set standard, but you should try to improve your personal score. PAp: this task test how good you are at responding quickly to situations. The purpose of this task is to see which students have the best reaction time. Therefore, as you perform this task I would like you to focus on performing better than as many people as possible. How you do on this task will tell me how good your reaction time is compared to others. There is no set standard, but you should perform better than as many people as possible. The graph will show you how high school students generally perform on this task.
Gelety (2011, study 1)†	Anagram task	Climate	MAp: self-referenced PAp: social comparison and self-presentation	MAp: we would like your group to engage in a task that involves conceptual problem solving. This is not a test at all. Although it is a very challenging task, it is simply a training tool that groups can learn from and use to improve their problem-solving skills. Our research indicates that these are skills that can be acquired over time, and your group will have an opportunity to improve. PAp: we would like your group to complete a problem-solving test, which involves decision making and strategic skills, both crucial aspects of intelligence. This is a new kind of ability test designed specifically for groups. Whereas older group-based ability and intelligence measures often depended on knowing facts, scores on this one, instead, reflect the ability of a group to effectively carry out a

				task. It is a very challenging task that we will use to discriminate between high-ability groups and low-ability groups.
*Gelety (2011, study 2)†	Anagram task	Climate	MAp: self-referenced PAp: social comparison and self-presentation	MAp: we would like your group to engage in a task that involves conceptual problem solving. This is not a test at all. Although it is a very challenging task, it is simply a training tool that groups can learn from and use to improve their problem-solving skills. Our research indicates that these are skills that can be acquired over time, and your group will have an opportunity to improve. PAp: we would like your group to complete a problem-solving test, which involves decision making and strategic skills, both crucial aspects of intelligence. This is a new kind of ability test designed specifically for groups. Whereas older group-based ability and intelligence measures often depended on knowing facts, scores on this one, instead, reflect the ability of a group to effectively carry out a task. It is a very challenging task that we will use to discriminate between high-ability groups and low-ability groups.
*Giannini, Weinberg, & Jackson (1988)	A 3-min basketball shooting task and a one-on-one offensive basketball against a defensive player	Climate	MAp: self-referenced PAp: social comparison	MAp: subjects received feedback on performance in each trial. Subjects did not observe the other subject performing and had no visual or written specific feedback on the other subject's performance. Subjects were instructed to strive for improvement over their previous best score. Before each subsequent trial, subjects expressed their performance goal. PAp: subjects received feedback on their performance and the performance of the other subject present after pretest trials. They were then instructed to compete against each other in the following two trials with the goal being to beat the other subject. Before each subsequent trial, subjects were given feedback concerning both their own and their competitor's performance. Subjects then recorded specific performance goals based on this information. Control: subjects received no goal setting instructions and did not receive any specific feedback regarding their performance scores.
Graham & Golan (1991, study 1)	Levels-of-processing task	Climate	MAp: self-referenced PAp: self-presentation	MAp: it is very important for you to accurately understand the aims of this experiment. You are here to acquire new knowledge that could be useful to you, to understand correctly the experiments and the ideas developed in the text, and to discover new concepts. In other words, you are here to learn. PAp: It is very important for you to accurately understand the aims of this experiment. You are here to perform, to be good, to get a good grade on the Multiple Choice Test, to prove your abilities, and to show your competencies. Experimenters will evaluate your performance. This evaluation has to be as good as possible. Control: no specific instructions were given.
Graham & Golan (1991, study 2)	Levels-of-processing task	Climate	MAp: self-referenced PAp: self-presentation	MAp: many people make mistakes on these puzzles in the beginning but get better as they go along. When people see the puzzles as a challenge, it makes them try harder and have more fun along the way. The next activity is a lot like this one. So if you just concentrate on the task, try to see it as a challenge and enjoy mastering it, you will probably get better as you go along. PAp: From how you did on the puzzles, I have a pretty good idea of how good you are at this type of puzzle-solving compared to other kids your age. The next activity is a lot like this one in that people are either good at these activities compared to other kids their age or they are not. So how you do will tell me something about how good you are at this kind of task. Control: nothing was said about the child's performance and only procedural information was conveyed.
Green (1963)	Recall task	Climate	MAp: task- referenced PAp: self-presentation	MAp: we are interested in how rapidly and accurately each of these exercises can be completed. and repeatedly mentioned speed, accuracy, and completion. For the participants the initial questions about plans and interests were accompanied by the statement that they were asked "only because one never knows what may be important." PAp: A probable relationship between test performance and success in various professions was asserted and the experimenter added that "Since you will probably be going into teaching or some professional field, you can see why we

				are interested in how successful you will be on these tests."
Harackiewicz, Abrahams, & Wageman (1987)	Puzzles	Climate	MAp: task-referenced PAp: social comparison	MAp: later you will be shown whether your total point score is above or below the New Jersey Standard Score for these same puzzles. The standard score is the average score for New Jersey high schools. The researchers will tell you how to judge the quality of your performance on these puzzles by comparing your score to the standard score. PAp: later you will be shown whether the number of words you found is better or worse than the average number of words found on these very same puzzles by other New Jersey high school students. The researchers will tell you how to judge the quality of your performance on these puzzles by comparing the number of words you found against the average number found by other New Jersey high school students.
Haegberg (2000)†	Editing task (creative measure)	Climate	MAp: self-referenced PAp: social comparison	MAp: on the next task, I really want you to try to learn and apply the rules of proper writing that were emphasized in the computerized training and in your training information packet. You should view the next editing task as an opportunity to improve your writing skills. In other words, the purpose of the next task is for you to try to increase your mastery in proper writing-style. PAp: on the next editing task, I really want you to try to do better than the other students who are also working on the task. To ensure that you outperform the other students, you should try to obtain a score near the 95th percentile. You should view the next editing task as an opportunity to show how knowledgeable you are about proper writing style. In other words, the purpose of the next task is for you to try to do better than the other students and to show me how much you know.
Hole & Crozier (2007)	Tangram task	Climate	MAp: task-referenced PAp: social comparison	MAp: I'm going to give you some puzzles which should help you to learn how to solve problems. In these tasks you'll learn how to solve puzzles. It doesn't matter how many you get right, just enjoy it and you'll probably find you improve your skills as you go along. PAp: I'm going to give you some puzzles to test how good you are at solving problems. These tasks test problem solving which is an important skill. Children who solve these tests are very good problem solvers. These tests will show how good you are at solving problems compared to other children your age so try to get the best score you can.
Jagacinski, Madden, & Reider (2009)	The participants had to think of uses for common objects	Climate	MAp: self-referenced PAp: self-presentation	MAp: participants were told that everyone is capable of being creative, that the task would give them a chance to express and develop their creativity, and that we were interested in how students develop their creative skills. PAp: participants were told that the task was a measure of creative ability, that some students had the creative ability to do well on this type of task, but others did not, and that we were interested in how well they could perform relative to other students. Control: students were told that they would be generating old and new ideas.
Jagacinski, Kumar, & Kokkinou (2008)	Problem solving task	Climate	PAp: social comparison	PAp: participants were told that the problems they would be working on were designed to assess intelligence and that we would be comparing their performance to that of other students. Control: the problems were said to be like brainteasers and that we were interested in understanding the learning process as the participants developed their skills at the task.
Jiang & Elen (2011)	test about a text passage	Content	MAp: task-referenced	MAp: participants received four learning goals which were placed at the beginning of the text. Explain in your own words what is expected from you and what you plan to do to achieve this goal. Control: participants were asked to study a scientific text1 on the relation between obesity and impulsivity.

Johnson (2010)†	The participants had to solve fractions (math ability test)	Content en climate	MAp: task-referenced PAp: social comparison	MAp: the purpose of this instruction is to learn more about solving fractions. You should try to do your best. It is okay if you make mistakes. Remember, making mistakes is part of the learning process. The total number of correct answers will be displayed on your screen. You can attempt to solve it as many times as you wish. PAp: the purpose of this instruction is to outscore you classmates at solving fractions and win. The total number of correct answers will be displayed on your screen. You can attempt to solve it as many times as you wish. Control: No purpose was stated.
Koestner, Zuckermann, & Koestner (1987)	Nina puzzles	Climate	MAp: task-referenced PAp: self-presentation	MAp: the puzzles were described without mentioning any relation to creative intelligence; in addition, the task was referred as a puzzle instead of as a test. PAp: participants were told that the hidden-figure test measures ability to break down and reorganize a perceptual field and that this ability is associated with creative intelligence; in fact, it was said, such tests are even used as one component of many IQ batteries.
*Koestner, Zuckermann, & Koestner (1989)	Nina puzzles	Climate	MAp: task-referenced PAp: self-presentation	MAp: this is a puzzle that some children find to be fun, the object is to find as many Nina's as you can. PAp: this is a test to see how well children can find hidden objects. We think that kids who do well at these may also do well at geometry, which is a kind of math, later in school. The object is to find as many hidden Nina's as you can.
*Kolovelonis, Goudas, & Dermitzaki (2011)	Darth-throwing task	Content	MAp: task-referenced PAp: self-presentation	MAp: participants were told that their goal during practice was to perform correctly the throw and the follow through steps of dart-throwing. They were asked to focus on these aspects of dart-throwing prior the execution of the moves to improve their technique. PAp: participants were told that their goal was hit the center of the target in each trial. MAp/PAp: participants were asked to focus on correctly performing the throw and the follow through steps of dart-throwing and second, to the center of the target in each trial. Control: participants were only told to do their best.
*Kolovelonis, Goudas, & Dermitzaki (2012)	Dart throwing task	Content	MAp: task-referenced PAp: self-presentation	MAp: participants were told that their goal during practice was to correctly perform the throw and the follow-through steps of dart-throwing. PAp: participants were told that their goal was to hit the center of the target in each trial. Control: participants were told to do their best.
Kozlowski & Bell (2006)	Tandem task	Content en climate	MAp: self-referenced PAp: self-presentation	MAp: instructions framed task mastery as acquirable knowledge and skill, and that trainees should use practice as an opportunity to develop their capabilities. They were encouraged to use errors and feedback as learning opportunities and to focus on task mastery rather than outcome achievement. The learning goals focused on skills needed to develop proficiency and on the deep principles and strategies embodied in the task and its performance context. Each learning goal was listed on the goal sheet along with a short description of the goal. Learning goals focused trainee attention on learning important skills and concepts. PAp: instructions framed task performance as a demonstration of competence. Participants were encouraged to avoid mistakes and to use their score and feedback to gauge their ability. Performance goals focused trainees' attention on achieving a specific performance score.
Kozlowski, Gully, Brown, Salas, Smith, & Nason (2001)	Tandem task	Content en climate	MAp: task-referenced PAp: self-presentation	MAp: participants were advised that their purpose was to learn, understand, and master the simulation. They were oriented to explore a sequence of learning objectives, to use errors as learning opportunities, and to use their scores as diagnostic feedback. They were told that they should focus on the learning goals, using them to guide their learning, practice, and skill development. They were

				advised to think about their score as feedback that could help them to learn about the game. Trainees were presented with mastery goals prior to each training trial. PAp: participants were instructed that their purpose was to perform at their maximum during the study. They were oriented to achieve a difficult and specific level of performance during each trial. The importance of achieving their score goals and maximizing correct decisions was emphasized. They were told to minimize incorrect decisions, because each incorrect decision would take an extra correct decision to get them back to the same score. Trainees were presented with a performance goal prior to each training trial that specified the score that they were to achieve during the trial.
Ladd (2009)†	Comprehension skill test	Climate	MAp: task-referenced	MAp: the participants read either an anecdotal or an empirical message about learning goals. Anecdotal: one group of students, when asked why they willingly completed assignments, reported that they wanted to make every effort to learn and improve themselves. This group was described as having learning goals. A second but different group, when presented with assignments, tended to favor performance goals. They were more concerned about showing their abilities and outdoing theirs. Empirical: some theorists have explored the relationships between learning goals, performance goals, and classroom behaviors. They have found, a pattern of relationships connecting learning goals to positive educational outcomes is emerging. Engaging in such strategies as self-regulation in the pursuit of learning, deep processing of information, and persistence in the face of difficult academic tasks, those who prefer learning goals are likely to enjoy learning while gaining useful knowledge and skills. Control: participants read a control message about how the mind forgets.
*Lawrence, & Crocker (2009, study 1)	Verbal problem -solving task	Climate	MAp: task-referenced PAp: self-presentation	MAp: the instructions emphasized that the experiment was about problem solving styles and approaches, and not about the number of correct answers. PAp: the instructions informed students that the test measured verbal ability, that the experiment was to measure their strengths and weaknesses, and that the experimenter would give feedback on their score.
*Lawrence & Crocker (2009, study 2)	Math exam (problem-solving)	Climate	MAp: task-referenced PAp: self-presentation	MAp: the instructions indicated that the purpose was to examine problem-solving skills, and not about the number of correct answers. PAp: the instructions indicated that the purpose of the test was to examine math ability, that the experiment was to measure their strengths and weaknesses, and that the experimenter would give feedback on their score.
Linnenbrink (2005)	Math exam	Climate	MAp: self-referenced PAp: self-presentation MAp/PAp: self-referenced and self-presentation	MAp: the instruction emphasized the importance of learning, understanding, and improvement. PAp: the instruction emphasized the importance of demonstrating both individual and group-level competence, with a particular emphasis on competition for high scores among the groups. MAp/PAp: the instructions included elements of both the mastery and performance-approach conditions, with an emphasis on doing better than others and trying to learn and understand.
*Lovejoy (2012)†	Flawed Judgment Test: participants received a series of brief arguments and were asked to identify whether the arguments were logically sound or logically flawed	Content en climate	PAp: social comparison PAv: social comparison	PAp: this study is designed to compare college students on how well they do on both parts of the Critical Thinking test. At the end of the session, you'll receive information about how you performed overall, relative to other NIU students. At this point, students often find it useful to adopt a goal to focus on for the remainder of the session. Given that the purpose of the session is to compare college students to each other on how well they perform, it's recommended that you adopt a "performance goal" for the rest of the session. People who pursue a performance goal focus on performing better than others in this study. In other words, try to do better than as many other students as possible. PAv: This study is designed to compare college students on how well they do on both parts of the Critical Thinking test. At the end of the session, you'll receive information about how you performed overall, relative to other NIU students. At this point, students often find it useful to adopt a goal to focus on for the remainder of the session. Given that the purpose of the session is to compare

				college students to each other on how well they perform, it's recommended that you adopt a "performance goal" for the rest of the session. People who pursue a performance goal focus on not performing worse than others in this study. In other words, try to avoid doing worse than as many other students as possible. Control: participants did not receive any other information, other than the false feedback.
Mangos & Steele-Johnson (2001)	Class scheduling task	Climate	MAp: self-referenced PAp: self-presentation	MAp: the task instructions were designed to create the perception that skill on the task could being raised through the effort and practice, That is,"…skills on problem-solving tasks such as class scheduling are developed through practice … working on [the] task provides people with an opportunity to improve their logical reasoning skills … You can track your improvement from trial to trial. …" PAp: the task instructions were designed to create the perception that skill on the task was related to stable, underlying abilities. That is,"…working on [the] task provides people with an opportunity to demonstrate their logical reasoning skills … initial performance is a good indicator of later performance. The higher your performance on this task, the higher your logical reasoning skills…"
*Matthews (2007)†	STAR Math assessment	Climate	MAp: self-referenced	MAp: implementation of mastery approach goal structures in the mathematics classrooms using the TARGET framework and strategies. Control: regular math classes.
Miles (2010, part 1)†	STAR Math assessment	Climate	MAp: self-referenced	MAp: implementation of mastery approach goal structures in the mathematics classrooms using the TARGET framework and strategies. Control: regular math classes.
Miles (2010, part 2)†	STAR Math assessment	Climate	MAp: self-referenced	MAp: implementation of mastery approach goal structures in the mathematics classrooms using the TARGET framework and Strategies. Control: regular math classes.
Moos (2004)†	Answer questions about a text passage	Climate	MAp: task-referenced PAp: social comparison PAv: social comparison	MAp: In this learning task, you will be given the opportunity to study the respiratory system. After the learning task, you will be given a posttest that measures your learning. Though I will be scoring the posttest, I am again most interested in how you learn in this environment. You should use this time to learn as much as you can about the respiratory system. PAp: the purpose of this learning task is to compare the performance of undergraduate students to one another. University of Maryland undergraduates are fairly comparable in terms of how they learn. However, some students stand out because they perform quite well in this learning task and on the posttest. I will be comparing your answers on this learning task, as well as your performance on the posttest, with other University of Maryland students. In this learning task and on the posttest, you will be given an opportunity to demonstrate that you excel on the learning task questions and on the posttest. PAv: the purpose of this learning task is to compare the performance of undergraduate students to one another. University of Maryland undergraduates are fairly comparable in terms of how they learn. However, some students stand out because they perform quite poorly in this learning task and on the posttest. I will be comparing your answers on this learning task, as well as your performance on the posttest, with other University of Maryland students. In this learning task and on the posttest, you will be given an opportunity to demonstrate that you do not perform poorly on the learning task questions and on the posttest.
Mousseau (2011)†	Math Test	Climate	MAp: task-referenced	MAp: a PowerPoint was presented. After the presentation, students will complete a writing activity in which they were asked to think of things they learned to do well, and to recall how practice had been the key to attaining mastery. Control: the control group participated in their regular life skills curriculum.
Newman & Schwager (1995)	Problem solving task	Climate	MAp: task-referenced PAp: self-presentation	MAp: working on math puzzles like these will probably help you learn new things in math, and that may, really help you do well in math class. In fact, it might be a big help in school, in general, because doing these puzzles tends to "sharpen the mind" and make you think. It helps you become more skillful at solving all sorts of problems. So, you see, it is important to understand how to do these puzzles.

				PAp: how you do on math problems like these helps us know how smart you are in math and what kind of grade you might get in math class. We are interested in how you do compared with other kids at your grade level. I'll let you know at the end of the session how you did compared with all the other kids. So, you see, it is important to complete as many of the problems as possible.
Nichols, Whelan, & Meyers (1991)	Rule-learning problems	Content	MAp: task-referenced PAp: social comparison	MAp: remember, try to do the best job that you possibly can. The more problems that you attempt and the harder you try, the better you get. I am only interested in how hard you try to solve these problems. PAp: remember, try to do better than anyone else. Try not to make mistakes because, if you make mistakes, you will not solve as many problems as other students and you want to look smart. Try to solve more problems correctly than anyone else.
Noordzij, Van Hooft, Van Mierlo, Van Dam, & Born (2013)	Reemployment	Content en climate	MAp: task- and self-referenced	MAp: the learning goal training used goal content (setting learning goals) as well as goal climate, conducive to learning and development. An LGO climate was created by means of the motto of the training: "Goals will help you improve your job-search abilities'. Participants also practiced with setting mastery goals. They developed learning goals such as: "I want to learn how to look for job openings that are suitable for me. Participants were also provided with feedback. Control: in the choice-making training, cues were used to create an atmosphere conducive to making choices.
Nowakowski (2004)†	Tandem task	Content	MAp: task-referenced MAv: task-referenced PAp: self-presentation PAv: self-presentation	MAp: you may want to think of your objectives today as directions from you superior, and work towards these objectives so that you can learn as much as possible about the simulation can be successful. You want to excel, succeed, and master the simulation. MAv: you may want to think of your objectives today as directions from you superior, and work towards these objectives so that you can avoid failing to master the simulation. You do not want to fail to learn everything there is to know about the simulation. PAp: you may want to think of your objectives today as directions from you superior, and work towards these objectives so that you can be successful in front of your fellow officers. You want your peers to see you succeeding, and you want to set a good example by doing well during you training session. PAv: you may want to think of your objectives today as directions from you superior, and work towards these objectives so that you can avoid failing in front of you fellow officers. o master the simulation. You do not want to your peers to see you fail, and you do not want to set a bad example by doing poorly during you training session.
Ntoumanis, Th∅Gersen-Ntoumani, & Smith, (2009)	Dart-throwing task	Climate	MAp: self-referenced MAv: self-referenced PAv: social comparison	MAp: this research is being conducted in order to better understand how students engage in a new task. The aim of this session is to see if you can improve your own dart-throwing performance. At the end of the study, you will be provided with information regarding your performance scores. Your scores will not be compared against the scores of other people in this lab. MAv: this research is being conducted in order to better understand how students engage in a new task. The aim of this session is to see if you can avoid making mistakes that can hinder your own dart-throwing performance. At the end of the study, you will be provided with information regarding your performance cores. Your scores will not be compared against the scores of other people in this lab. PAv: this research is being conducted in order to better understand how students engage in a new task. The intention is to compare students to one another according to their dart- throwing ability. If your performance is worse than the majority of students, you will demonstrate that you have a low level of dart-throwing ability. At the end of the study, a spreadsheet will be provided with information regarding everyone's performance scores.
Pfeifer (1991)†	Problem-solving task	Climate	MAp: self-referenced PAp: self-presentation	MAp: the text advised participants not to worry about mistakes or failure, but to use each opportunity to grow and acquire new skills. PAp: the text stressed that performance was the only measure of worth.

Roberson & Alsua (2002, study 2)	In-basket exercise: participants had to find and use all of the memos relevant to each of the decisions and also consult the informational memos.	Climate	MAp: self-referenced PAp: self-presentation	MAp: instructions indicated that the purpose of the task was to develop and improve one's skills as follows: "The activity before you is intended to help you to develop and refine skills used in making managerial decisions and will therefore help you develop proficiency in making these decisions. You should think of this training activity as a chance to develop and improve your managerial skills." PAp: instructions emphasized that the purpose of the task was to demonstrate one's skills as follows: "The activity before you should enable you to utilize your existing managerial decision making skills and will therefore allow you to assess your proficiency in making these decisions. You should think of this assessment activity as an opportunity to test and demonstrate your managerial skills and your competence as a manager."
Ryan (1982)	Nina puzzles	Climate	MAp: task-referenced PAp: self-presentation	MAp: participants attention was drawn to the activity without mentioning relation to creative intelligence. The description of the activity was the same length as the ego-involving description, bit it addressed the background of the task rather than the ego-involving properties of the task. PAp: hidden figure tasks involve the ability to break down and reorganize a perceptual field. This ability requires a flexibility of cognitive capacities that has been shown in previous studies to be highly associated with creative intelligence; in fact, such puzzles are even used as one component of many IQ tests.
Ryan, Koestner, & Deci (1991, study 1)	Nina puzzles	Climate	MAp: task-referenced PAp: self-presentation	MAp: attention was drawn to the activity without mentioning its relationship to creative intelligence. PAp: the induction described the activity as a test of creative intelligence, often used as a component of IQ tests, which requires the capacity to break down and reorganize a perceptual field.
Ryan, Koestner, & Deci (1991, study 2)	social perception task: participants had to examine photos of (a) a romantic couple and determine whether the couple was posed or genuine and (b) two people in a business setting and judge which person was the boss.	Climate	MAp: task-reference PAp: self-presentation	MAp: This task is a kind of game that you might find interesting, We are trying to get some idea of what people's reactions to it are and how well people can do. It is fairly typical of new types of social perception tasks being designed by psychologists. PAp: This task is a test of social intelligence; it will show how well you are able to see through social situations. This particular form of social intelligence puts people in a better position to influence or manage others. In fact, preliminary research with this instrument suggests that effective leaders generally tend to do better at it."
Ryan, Koestner, & Deci (1991, study 3)	Participants had to copy geometric figures with their non- dominant hand beneath an apparatus that denied them visual input.	Climate	MAp: not specified PAp: self-presentation	MAp: participants were told that this was a new task that had not yet been used in research and was being piloted for possible future use. PAp: participants were lead to believe that performance on the task was reflective of their perceptual cognitive functioning and that this was directly related to intelligence and creativity.
Rusk (2012) †	Participants completed a task designed to assess their ability to use cognitive reappraisal in response to an emotional induction	Climate	MAp: self-referenced	MAp: the intervention was designed to promote learning goals, including fostering exploration, offering choice, encouraging experimentation, and other aspects of the TARGET framework. Control: waiting list.
Schrager (2008, study 2) †	Darth throwing task	Content	MAp: self-referenced PAp: social comparison	MAp: previous research has identified different types of goals that people often pursue during leisure activities. One such goal is a mastery goal. When people pursue a mastery goal, they are motivated by the desire to develop and improve their skills. during today's session, we recommend that you adopt a mastery goal. In other words, try to do well by developing and improving your dart throwing skills. Focusing on skill development will help you score as many points as possible during the official rounds. PAp: today's session is designed to collect information about student's reactions to the darts activity. The object of today's session is to score as many points as possible in two rounds of dart throwing. The experimenter will record your scores after each round. At the end of the session, the experimenter will tell you whether your score is above or below the average score. You will be competing with the

				participant in the other lab room. The participant who gets the highest total score will win the competition. To ensure a fair competition, you and your opponent will switch rooms after the first round of darts. You will each play the second round of darts using your opponent's board and then return to your original lab room to finish the session. Your opponent is presently listening to these same instructions. Once again, we ask that you refrain from talking with the experimenter while throwing darts except when reporting your scores.
Schrager (2008, study 3a)†	Darth throwing task	Content	MAp: self-referenced PAp: social comparison	MAp: previous research has identified different types of goals that people often pursue during leisure activities. One such goal is a mastery goal. When people pursue a mastery goal, they are motivated by the desire to develop and improve their skills. During today's session, we recommend that you adopt a mastery goal. In other words, try to do well by developing and improving your dart throwing skills. Focusing on skill development will help you score as many points as possible during the competition rounds. PAp: previous research has identified different types of goals people often pursue during competitions. One such goals is a performance goal. When people pursue a performance goal, they are motivated by the desire to outperform others. During today 's session, we recommend that you adopt a performance goal. Try to throw each dart as well as possible and concentrate on performing better than other participants. Focusing on performing better than others will help you score as many points as possible during the competition rounds. Control: today's session is designed to collect information about student's reactions to the darts activity. The object of today's session is to score as many points as possible in two rounds of dart throwing. The experimenter will record your scores after each round. At the end of the session, the experimenter will tell you whether your score is above or below the average score.
Schunk (1989)	Subtraction problems	Climate	MAp: self-referenced PAp: self-presentation MAp/ PAp: self-referenced and self-presentation	MAp: this treatment was identical to the ability feedback condition except that following the child's reply the proctor linked the child's prior achievement with effort by remarking, "You've been working hard." This remark also was given matter-of-factly and without accompanying social reinforcement, after which the proctor departed. PAp: the proctor monitored the progress of these, children every 8 min during each training session by walking up to each child and asking, "What page are you working on?" After children replied with the page number, the proctor linked children's prior achievement to ability by remarking, "You're good at this." The ability feedback was given in a matter-of-fact tone of voice and without any accompanying, social reinforces such as smiles or pats. The proctor then departed. Control: participants were monitored in the same fashion as the MAp and PAp groups except that after the child replied, the proctor remarked, "OK," and departed. MAp/PAp: these children received both forms of feedback. The procedures were similar to those of the previous conditions. Following the child's reply, the proctor either remarked, "You're good at this, and you've been working hard" or, "You've been working hard and you're good at this."
*Schunk (1996, study 1)	Addition and subtraction of fractions	Content	MAp: task-referenced PAp: self-presentation	MAp: while you're working it helps to keep in mind what you're trying to do." The teacher then stressed the session goal of learning to solve problems, rather than simply solving them, by saying, "You'll be trying to learn how to solve fraction problems where the denominators are the same and you have to add the numerators." PAp: while you're working it helps to keep in mind what you're trying to do." The teacher then provided a session goal that did not explicitly mention learning ("You'll be trying to solve fraction problems where the denominators are the same and you have to add the numerators").
Schunk (1996, study 2)	Addition and subtraction of fractions	Content	MAp: task-referenced PAp: self-presentation	MAp: while you are working on computer assignments it helps to keep in mind what you are trying to do. At the beginning of the course you received a list of expected outcomes from your Hypercard period. These are shown on this page and can be thought of as goals that you are trying to accomplish. So while your

				are receiving Hypercard instruction and working on assignments you should keep in mind the goals listed on this page. PAp: while you are working on computer assignments it helps to keep mind what you are trying to do. At the beginning of the course you were advised to try to complete your assignments. So while you are receiving Hypercard instruction and working on assignments you should keep in mind the goal of trying to complete your assignments.
Schunk & Ertmer (1999, study 1)	computer skill application task	Content	MAp: task-referenced PAp: self-presentation	MAp: while you are working on computer assignments it helps to keep in mind what you are trying to do. At the beginning of the course you received a list of expected outcomes from your Hypercard period. These are shown on this page and can be thought of as goals that you are trying to accomplish. So while you are receiving Hypercard instruction and working on assignments you should keep in mind the goals listed on this page. PAp: while you are working on computer assignments it helps to keep mind what you are trying to do. At the beginning of the course you were advised to try to complete your assignments. So while you are receiving Hypercard instruction and working on assignments you should keep in mind the goal of trying to complete your assignments.
Schunk & Ertmer (1999, study 2)	computer skill application task	Content	MAp: task-referenced PAp: self-presentation	MAp: while you are working on computer assignments it helps to keep in mind what you are trying to do. At the beginning of the course you received a list of expected outcomes from your Hypercard period. These are shown on this page and can be thought of as goals that you are trying to accomplish. For example, some of these goals are to learn to use different fonts, format and size fields. So while you are receiving HyperCard instruction and working on assignments you should keep in mind the goals listed on this page. PAp: while you are working on computer assignments it helps to keep mind what you are trying to do. At the beginning of the course you were advised to try to complete your assignments. So while you are receiving Hypercard instruction and working on assignments you should keep in mind the goal of trying to complete your assignments.
Schunk & Rice (1989)	Reading comprehension task	Climate	MAp: task-referenced PAp: self-presentation	MAp: while you're working, it helps to keep in mind what you're trying to do. You'll be trying to learn how to use the steps to answer questions about what you've read. PAp: while you're working, it helps to keep in mind what you're trying to do. You'll be trying to answer questions about what you've read. Control: while you're working, try to do your best.
Schunk & Rice (1991)	Comprehension skill test	Content	MAp: task-referenced PAp: self-presentation	MAp: the instructor emphasized learning the steps in the strategy by remarking at the start of each session, "While you're working, it helps to keep in mind what you're trying to do. You'll be trying to learn how to use the steps to answer questions about what you've read." PAp: while you're working, it helps to keep in mind what you're trying to do. You'll be trying to answer questions about what you've read.
Senko, Durik, Patel, Lovejoy, & Valentiner (2013, study 1)	Multiplying digits	Content	MAp: self-referenced PAp: social comparison	MAp: for this type of activity, people often pursue a mastery goal. Mastery goals involve trying to develop and improve your mastery of a skill that you are being taught. We recommend that you adopt a mastery goal for today's session. In other words, try to develop a good command of the new Left-to-Right technique. At the end of the session, you will receive feedback to help determine if you successfully met this mastery goal. PAp: for this type of activity, people often pursue a performance goal. Performance goals involve trying to do better than other people who are doing the same activity. We recommend that you adopt a performance goal for today's session. In other words, try to do better than previous participants. At the end of the session, you will receive feedback about whether you successfully met this performance goal.
Senko & Harackiewicz (2005, study 1)	Boggle (word game)	Content	MAp: self-referenced PAp: social comparison	MAp: the next two puzzles are an opportunity for you to further develop your Boggle skill. Therefore, we recommend that you adopt a "mastery goal" for the

				next pair of puzzles. Achieving this mastery goal involves learning and using the word-finding strategies on the next pair of puzzles. PAp: the next two puzzles are an opportunity for you to see how well you can perform at Boggle compared to other students. Therefore, we recommend that you adopt a "performance goal" for the next pair of puzzles. Achieving this performance goal involves finding more words than other participants on the next pair of puzzles.
Senko & Harackiewicz (2005, study 2)	Boggle (word game)	Content	MAp: self-referenced PAp: social comparison	MAp: previous research has identified different types of goals that people often adopt for an activity like this. "One such goal is a "mastery" goal. People who pursue a mastery goal approach the activity as an opportunity to develop their skills. We recommend that you adopt a mastery goal for the next pair of puzzles. In other words, focus on developing a strong command of the word finding strategies that were suggested earlier. PAp: previous research has identified different types of goals that people often adopt for an activity like this. "One such goal is a "performance" goal. People who pursue a performance goal approach the activity as an opportunity to test their skill against other people. We recommend that you adopt a performance goal for the next pair of puzzles. In other words, focus on doing better than previous participants.
Song (2004)†	Problem-solving task	Climate	MAp: task-referenced PAp: social comparison	MAp: in the task design for each phase of the PBL situation, the researcher included task-instruction messages stressing the importance of challenging work and the intrinsic value of learning. Second, for distribution of authority, control over choice was provided to students. Students in the learning-oriented context were allowed to set priorities and choose activities that interested them. Third, for evaluation practice, peer groups' performances were evaluated privately. PAp: first, for task design, the researcher provided task-instruction messages stressing the importance of performance. Second, for distribution of authority, the researcher set choices or controls of learning activities. The researcher provided students with prompts leading them to the next learning activity instead of allowing them to choose which activity to work on next. Recommendations on time management were also provided to students so that they could efficiently complete assignments within the class period. Third, for evaluation practice, peer groups' performance evaluations were posted publicly. They included social comparison information and evaluation comments based on norm-referenced standards.
*Steel- Johnson, Beauregard, Hoover, & Schmidt (2000, study 1)	Problem solving task	Climate	MAp: self-referenced PAp: self-presentation	MAp: participants were instructed that "skills on problem solving tasks like the class scheduling task are developed through practice, the more people practice, the more capable they become, you can expect to make some mistakes, you should see your performance improve with practice." PAp: participants were instructed that performance on problem-solving tasks like the class scheduling task reflects basic cognitive capabilities and that the higher their underlying cognitive capacities are, the better their problem solving is. Participants were informed that this task provides a vehicle for gauging underlying cognitive capacities.
*Steel- Johnson, Beauregard, Hoover, & Schmidt (2000, study 2)	Problem solving task	Climate	MAp: self-referenced PAp: self-presentation	MAp: participants were instructed that "skills on problem solving tasks like the class scheduling task are developed through practice, the more people practice, the more capable they become, you can expect to make some mistakes, you should see your performance improve with practice." PAp: participants were instructed that performance on problem-solving tasks like the class scheduling task reflects basic cognitive capabilities and that the higher their underlying cognitive capacities are, the better their problem solving is. Participants were informed that this task provides a vehicle for gauging underlying cognitive capacities.
Steel-Johnson, Heintz, & Miller (2008)	Matching psychology terms with their corresponding definitions	Climate	MAp: self-referenced PAp: social comparison	MAp: participants were informed that they could increase their task performance by developing strategies for learning the terms and definitions. With respect to feedback, we provided participants in the learning goal condition with self-based feedback provided privately. With respect to rewards, we provided participants in

				the learning goal condition with a reward based on self-based performance improvement. PAp: participants were informed that it was important to match as many terms and definitions as possible and that participants should focus on comparing their performance relative to others' performance. With respect to feedback, we provided participants with normative-based feedback publicly. With respect to rewards, we provided participants with a publicly provided reward. Control: participants received no information regarding task learning approaches or the importance of attaining high performance levels or evaluating their performance relative to others. They received no self-based or normative-based performance (improvement) feedback, and did not have an opportunity to receive rewards.
*Steel-Johnson, Perlow, & Pieper (1993)	Moving a robotic arm to retrieve a payload in space and stow it safely in the shuttle's payload bay	Climate	MAp: task-referenced PAp: self-presentation	MAp: participants were told: "You made different types of errors." The experimenter then read a specific feedback message for each type of error made. These messages included a restatement of the rule and, where appropriate, a suggestion for avoiding the error in the future. Subjects were not allowed to read the feedback message list, but they could review all rules at any time during task performance. PAp: participants were told: "You made different types of errors. You may wish to review the performance rules before performing the next trial." Subjects were then provided with a list of the rules but were not told which they had violated.
Van Hooft & Noordzij (2009)	Job searching	Content en climate	MAp: self-referenced PAp: self-presentation and social comparison	MAp: the workshop started with the general framing, "view this workshop as a useful aid to increase your job seeking skills" People were asked to explain what they had learned about job seeking until now, both about positive and negative events. Next, learning goals were explained and examples were given of learning goals in job seeking. Participants were invited to practice with setting learning goals in their exercise book. Feedback was given, both positive and negative, to ensure a climate of development and improvement. Participants were encouraged to focus on learning different strategies, on viewing errors as learning opportunities, and on searching for challenges and ways to improve their job search skills. PAp: the workshop started with the general framing, "view this workshop as a useful aid to get the best results in searching for employment". People were asked to mention something at which they had recently succeeded. Next, performance goals were explained. It was emphasized that people generally perform better when they compete and that goals can be used to achieve superior outcomes. Examples were given of performance goals in job seeking. Participants were invited to practice with setting performance goals in their exercise book. To ensure a climate of competition and outperforming others, only positive feedback was given, and participants were given compliments. Participants were encouraged to focus on positive outcomes, to compete with others, and to reward themselves when performing well. Control: the workshop had the same structure but focused on the exploration of one's personality. The general framing was, "view this workshop as a way to explore yourself as related to job seeking." Participants could say what- ever they wanted to say about themselves or their job search. Participants were instructed to fill out the questionnaire and to calculate their personality scores. The scores were discussed and related to job seeking.
Van Yperen, Elliot, &Anseel (2009, study 1)	Verbal skills test	Content	MAp: self-referenced PAp: social comparison MAv: self-referenced PAv: social comparison	MAp: research shows that people do best on these kind of tests when they hold a specific goal. Therefore, we recommend that you adopt a specific goal when completing Version 2. Do better than your total score in Version 1. PAp: research shows that people do best on these kind of tests when they hold a specific goal. Therefore, we recommend that you adopt a specific goal when completing Version 2. Do better than the average total score in your norm group. MAv: research shows that people do best on these kind of tests when they hold a specific goal. Therefore, we recommend that you adopt a specific goal when completing Version 2. Don't to do worse than your total score in Version 1. PAv: research shows that people do best on these kind of tests when they hold a

				specific goal. Therefore, we recommend that you adopt a specific goal when completing Version 2. Don't do worse than the average total score in your norm group.
Van Yperen, Elliot, & Anseel (2009, study 2)	In-basket exercise.	Content	MAp: self-referenced PAp: social comparison MAv: self-referenced PAv: social comparison	MAp: research shows that people do best on these kind of tests when they hold a specific goal. Therefore, we recommend that you adopt a specific goal when completing Version 2. Do better than in Version 1. PAp: research shows that people do best on these kind of tests when they hold a specific goal. Therefore, we recommend that you adopt a specific goal when completing Version 2. Do better than most other participants in Version 2. MAv: research shows that people do best on these kind of tests when they hold a specific goal. Therefore, we recommend that you adopt a specific goal when completing Version 2. Don't do worse than in Version 1. PAv: research shows that people do best on these kind of tests when they hold a specific goal. Therefore, we recommend that you adopt a specific goal when completing Version 2. Don't do worse than most other participants in Version 2.
Van Yperen (2003, study 2)	Verbal skills test	Content	MAp: self-referenced PAp: social comparison MAv: self-referenced PAv: social comparison	MAp: perform better than your total score in Version 1. PAp: perform better than the average total score in your norm group. MAv: don't perform worse than your total score in Version 1. PAv: don't perform worse than the average total score in your norm group.
Winters & Latham (1996)	Problem solving task	Content	MAp: task-referenced PAp: self-presentation	MAp: participants were given a learning goal sheet that assigned them the number of effective shortcuts they were to develop and use during the trial. They were also told to do their best to produce correct schedules quickly. PAp: participants were told to do their best at identifying effective shortcuts to producing correct schedules quickly. They were then given a sheet that assigned them an outcome goal in terms of the number of correct schedules that they were to produce. Control: The subject were told to do their best at identifying as many effective shortcuts as possible and to produce as many correct schedules as possible.

Note: studies indicated with an asterisk indicate studies whereby the sample size was modified because it was not clear how the participants were divided. When a study indicated that subjects were randomly divided, and the number of participants could not be equally divided, the total number of participants was adjusted. Studies indicated with a cross indicate dissertations.