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ORIGINAL PAPER

The important role of the context in which achievement goals are adopted: an experimental test

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Abstract Two experimental studies using Elliot, Murayama, and Pekrun's (Journal of Educational Psychology 103(3):632–648, 2011) differentiation between self-goals and task-goals, were conducted to examine the relative influence of achievement goals and motivational contexts on behavioral and emotional engagement. In Study 1, 133 college students were prompted to adopt self-goals (intrapersonal standards) or other-goals (performance standards) in one of two motivational contexts (autonomy-supportive or autonomy-suppressive) while playing a computer game. In Study 2, 129 college students performed the same assignment, this time adopting either other-goals or task-goals (absolute standards). Study 1 indicated that autonomy-support facilitated behavioral and emotional engagement in autonomy suppressive contexts, but self-goals merely promoted emotional engagement relative to other-goals. Study 2 replicated Study 1's findings by showing that autonomy support promoted self-reported behavioral engagement and task-goals promoted emotional engagement but further revealed that only when task-goals were adopted in an autonomy-supportive context did they promote better behavioral engagement than other-goals. Thus, Study 2 highlighted the importance of the context in which the achievement goals were adopted (i.e., autonomy-supportive versus suppressive) as an important determinant of the outcome.

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Introduction

In her classic paper, Ames (1992) unambiguously demonstrated that mastery goals were more adaptive than performance goals in a variety of learning-related outcomes. However, since then, achievement goal theorists have grappled with a growing body of evidence indicating that, in some cases, performance goals are linked with at least as many positive outcomes as are mastery goals, both in relation to academic achievements (e.g., Harackiewicz et al. 2002) and to performance and motivation in experimental tasks (Elliot and Harackiewicz 1996; Elliot et al. 2005).

To address the ambiguity, Elliot and colleagues (e.g., Elliot and Thrash 2001) developed the hierarchical model of achievement motivation to more accurately and narrowly define goals. This, in turn, led to the development of a more elaborate model of achievement goals, the 3×2 model of achievement motivation (Elliot et al. 2011), and to the examination of different goal-complexes (Elliot 1999). In the latter trend, researchers have explored the effect of the interaction between achievement-related motives and achievement goals on various sets of outcomes (for a recent review, see Vansteenkiste et al. 2014).

This paper presents two related experiments exploring how achievement goals affect behavioral engagement and emotional experience. For this, it draws on the 3×2 model of achievement goals (Elliot et al. 2011). It also considers motivational contexts (i.e., autonomy support vs. autonomy suppression), as specified in self-determination theory (SDT; Ryan and Deci 2000). Hence, this paper explores whether achievement goals and motivational contexts interact to affect outcomes.

Mastery and performance goals predict distinct outcomes

In the last three decades, achievement goals theory (Ames 1992; Dweck 1986; Elliot 1999) has provided an influential framework for explorations of human motivation. Originally, the theory differentiated between two primary goals: mastery goals, which focus on acquiring and developing competence, and performance goals, which focus on demonstrating one's competence and outperforming others. Over the years, the theory has evolved (for a recent review, see Senko et al. 2011). One notable shift has occurred in the definition of goals. Early conceptualizations construed achievement goals as a combination of reasons for behavior and the aim or outcome sought by the individual (Ames 1992; Dweck 1986; Nicholls 1984). Such definitions saw the links between achievement goals and various emotional and behavioral outcomes as clear and straightforward. Hence, both experimental and field studies linked mastery goals to better outcomes than performance goals (e.g., Ames and Archer 1988; Graham and Golan 1991; Kaplan et al. 2002; Urdan 1997; Daniels et al. 2009; Dewar et al. 2013; Ranellucci et al. 2015).

As noted above, however, researchers were confronted by evidence linking performance goals with at least as positive outcomes as mastery goals in performance attainment (Elliot and Harackiewicz 1996). Elliot and colleagues' hierarchical model of achievement motivation addressed the dilemma by creating a narrow and precise definition of goals, defining them strictly as aims (Elliot and Thrash 2001), not a combination of aims and reasons. Following this line of thought, researchers began gathering evidence that when the reason component is excluded from the definition of achievement goals, performance goals can sometimes be as adaptive as mastery goals.

Experimental studies had mixed findings on the effects of performance-approach and mastery goals on performance attainment. In some cases, mastery-goals were found to be more beneficial for performance than performance-approach goals (Bereby-Meyer and Kaplan 2005; Bergin 1995). In others, either performance-approach goals appeared to be more beneficial for performance than mastery goals (Elliot et al. 2005, Study 2; Senko and Harackiewicz 2005, Study 1) or mastery and performance-approach goals were equally beneficial for performance attainment (e.g., Elliot et al. 2006, 2005, Study 1a and 1b; Kavussanu et al. 2009).

Trying to address these ambiguities, Elliot et al. (2005) have suggested performance goals are characterized by shallow, instrumentally-based task encoding, which would better predict outcomes than mastery goals when short-term outcomes are considered or if instrumentalities are present. On the other hand, he linked mastery goals with long-term positive outcomes and a non-instrumental goal setting. A recent meta-analysis of 19 papers using the hierarchical model to experimentally explore the relations between mastery and performance goals over performance attainment (Van Yperen et al. 2015) found a relatively consistent pattern of results favoring mastery goals over performance goals, particularly when individuals did not anticipate feedback and when there was no time pressure. In the presence of feedback anticipation or time pressures, neither mastery goals nor performance goals yielded better performance.

The theoretical developments of Elliot and his colleagues opened the door to a thorough scrutiny of the differential effects of the various types of goals. One noteworthy theoretical development concerned the number of achievement goals. While early conceptualizations preferred a dichotomous goal concept, differentiating between mastery and performance goals, Elliot et al. (2011) proposed dividing mastery goals into two distinct constructs: "task-goals" that reflect an absolute standard of competence and "self-goals" that correspond to an intrapersonal standard of competence. In task-goals, competence is evaluated based on how one succeeds in mastering a given task and given a specific standard, and in self-goals, competence is evaluated on the basis of one's ability to improve one's performance relative to the past. In performance goals, termed "other-goals" in this model, competence is evaluated on the basis of one's ability to outperform others in a given task. Elliot et al. showed that the three goals predicted distinct outcomes in the educational context. They found task-approach goals to be more adaptive than self-approach goals, arguably because of the formers' more direct and immediate competence evaluation. They also found other-approach goals to be more adaptive than self-goals and task-goals in the context of academic achievements.

A second and equally important scientific trend was the exploration of different goal-complexes (Elliot 1999). This term originally referred to the combined impact of achievement goals and the classic concept of achievement-related motive dispositions (the need for achievement and the fear of failure; Atkinson 1957; McClelland et al. 1976) on achievement-related outcomes. Because the revised definitions of the goals did not include a motive component, researchers claimed that one particular achievement goal could have different underlying motive dispositions (Elliot 1999). Several studies recently explored the interaction between the SDT (Ryan and Deci 2000) concept of motives (autonomous and controlled reasons for behavior) and achievement goals, on various sets of outcomes (for a review, see Vansteenkiste et al. 2014).

Self-determination theory's definition of autonomous versus controlled reasons

SDT (Ryan and Deci 2000) emphasizes the various reasons (or motives) individuals have for their behaviors and goal pursuits, and considers how these relate to psychological health. SDT differentiates between two primary types of behavioral regulation: (1) autonomous regulation which includes a sense of choice and volition; (2) controlled regulation which includes a sense of internal or external compulsion. Considerable research has found autonomous regulation to be associated with higher positive consequences than controlled regulation (for a review, see Deci and Ryan 2008).

Much of the research in the SDT tradition has examined factors in the social environment that either facilitate or diminish autonomous regulation. Autonomy support is defined as the degree to which socializing agents: (1) take the target individual's perspective, (2) act in ways that encourage choice and self-initiation, (3) provide meaningful rationales and relevance, and (4) refrain from using language or other behaviors likely to be experienced as pressure toward particular behaviors (Grolnick et al. 1997; Reeve and Jang 2006). If autonomy is supported in these ways, the result will be autonomous regulation, effective performance, and psychological well-being (see Deci and Ryan 2000, 2008 for reviews). At the same time, substantial research has shown that events such as rewards, deadlines, threats, surveillance, and pressuring language can be experienced as controlling; this can undermine autonomous regulation, resulting in poorer performance and greater ill-being (Ryan and Deci 2000). Therefore, by promoting internalization and fostering autonomous reasons for behavior, autonomy support can be a very important socialization practice, providing an adaptive source of energy for behavior and prompting behavioral engagement.

Integrating achievement goal theory and SDT

Based on the differentiation of autonomous and controlled motivations, a growing body of research has focused on "controlled" versus "autonomous" reasons to pursue achievement goals (Benita et al. 2014; Delrue et al. 2016; Gaudreau 2012; Gaudreau and Braaten 2016; Gillet et al. 2015, 2014; Michou et al. 2016, 2014; Vansteenkiste et al. 2010a, b). Overall, researchers have found that autonomous reasons underlying both mastery and performance goals predict optimal outcomes relative to controlled reasons; moreover, the reasons to pursue a goal predicted variance in learning outcomes, above and beyond the goals per se. In a recent review of this new line of research, Vanteenkiste et al. (2014) suggested the integration of concepts from achievement goal theory and SDT is not only illuminative but also necessary for the achievement goal framework to move forward.

Most studies taking this integrated approach have focused solely on the reasons for behavior and have used a correlational design. There are two notable exceptions. Spray et al. (2006) conducted an experimental study exploring the effects on sports-related emotional and behavioral outcomes of adopting mastery and performance goals in autonomy supportive and controlling contexts. The autonomy-supportive context predicted better outcomes than the controlling context across all study variables, but no systematic pattern favoring mastery or performance goals emerged. However, as this study was not anchored in the hierarchical model of achievement goals, it did not differentiate between aims and reasons when defining goals. More recently, Benita et al. (2014, study 1) used a similar experimental design to show that mastery goals, manipulated as intrapersonal standards (self-goals) in the hierarchical model, predicted better emotional outcomes (self-reported interest/enjoyment and pressure/tension) when they were adopted in an autonomy-supportive context than when they were adopted in an autonomy-suppressive context.

Examination of the motivational context in which goals are adopted is important for several reasons. First, promoting a goal in an autonomy-supportive context can give rise to the autonomous adoption of the goal. Given the findings linking autonomous reasons for adopting goals with better outcomes than controlled reasons, close examination of the contextual terms facilitating autonomous reasons is crucial. Second, the context in which goals are adopted may have a profound influence on how they differentially predict performance and motivation. For instance, socializing agents (teachers, parents) may push students to adopt either mastery goals or performance goals. However, the autonomy-supportive or suppressive ways in which they promote these goals may affect students' performance and motivation in class above and beyond the specific goal being promoted.

Third, given the mixed findings on the effect of mastery goals versus performance goals on performance attainment, it is theoretically important to examine an interaction hypothesis whereby only mastery goals adopted in an autonomy-supportive context predict better behavioral outcomes than performance goals. Although Spray et al. (2006) did not find this interaction effect, they used measures of intrinsic and autonomous motivation as their dependent variables and did not assess performance attainment. Several other studies have found a similar interaction, accordingly both performance and mastery goals were positively related to students' educational outcomes if the reasons underlying their adoption are autonomous (Benita et al. 2014; Gaudreau 2012; Gaudreau and Braaten 2016; Gillet et al. 2014, 2015; Michou et al. 2014). Still others have failed to find this interaction effect (Delrue et al. 2016; Michou et al. 2016; Vansteenkiste et al. 2010a, b). However, these studies were correlational and did not directly compare the effects of mastery and performance goals, nor did they consider the context promoting goal adoption.

The current research

The research discussed herein included two experiments comparing different contexts in which mastery and performance goals were adopted. It expanded two previous experimental studies exploring similar questions (Benita et al. 2014; Spray et al. 2006) in various respects. First, unlike both previous experiments, it used behavioral measures in addition to self-reports. It assessed behavioral performance by measuring speed-accuracy tradeoffs, a common method to examine motor skill acquisition (MacKay 1982; Wickelgren 1977). Whereas speed reflects relatively low-level processing of the stimuli, accuracy requires precision and concentration, thereby reflecting higher-level processing. Typically, in skill acquisition, the relation between the two is negative, so that high speed comes at the expense of accuracy and vice versa (Beilock et al. 2008).

Second, like Spray et al. (2006) but unlike Benita et al. (2014), the research used a two-factor design, comparing mastery and performance goals adopted in different motivational contexts. The use of this strategy enabled the exploration of the proposed interaction effect. Third, the previous studies operationalized mastery goals merely as intrapersonal standards (Benita et al. 2014) or as absolute standards (Spray et al. 2006). Drawing on the 3×2 model of achievement motivation (Elliot et al. 2011), this research investigated the absolute standard of mastery goals, in addition to the intrapersonal standard. Thus, it was able to explore separately the differentiated effects of each standard of mastery goals relative to performance goals.

Importantly, the aim was not to validate the 3×2 model of achievement motivation or to compare self and task-goals. Rather, the 3×2 model was used to compare both standards of mastery goals with that of performance goals. We did not compare the three goals together in the same experiment because different manipulations are required for task-goals and self-goals. In Study 1, the manipulation of an intrapersonal standard (self-goals) involved measuring the dependent variables twice in two consecutive tasks while asking participants to improve their performance. Therefore, the goal to improve performance was embedded in the manipulation. Hence, to ensure adoption of pure task-goals with no involvement of self-improvement goals, a separate study was conducted to examine task-goals by asking participants to perform the task only once.

Study 1

The experimental procedure manipulated participants' adoption of either self-approach goals (an intrapersonal standard of competence) or other-approach goals (a normative performance standard of competence) in two different contexts and explored the effect on participants' behavioral and emotional engagement, as measured by self-reports and performance outcomes. The study treated speed and accuracy as quantitative and qualitative measures of behavioral engagement, respectively. In addition to the measures of behavioral engagement (i.e., speed and accuracy), it used two corresponding self-report measures: (1) effort, which reflects behavioral engagement, and (2) pressure/tension, which reflects emotional engagement.

We expected the following outcomes: (1) With regard to pressure/tension, following Benita et al. (2014), we hypothesized that an autonomy-supportive context and self-goals induction would predict less pressure/tension than an autonomy-suppressive context and other-goals induction, respectively. (2) For behavioral engagement, we expected an autonomy supportive context would predict better accuracy improvement from the first to the second game (qualitative behavioral engagement) than an autonomy-suppressive context. This effect was expected because the autonomy-supportive context emphasizes the importance and relevance of the task. Hence, participants were expected to identify more with the experiment's goals and, therefore, to invest more effort in maximizing their quality of performance and executing the task meticulously. Because an autonomy-suppressive context pressures participants to improve, it was expected to be a powerful motivator for a fast performance. Yet as this context was also expected to elevate experiences of pressure/tension and lower the internalization, behavioral engagement was not expected to be optimal; it should result in a hasty and careless performance, so that any improvement in speed would come at the expense of accuracy.

Because the experiment contained both feedback anticipation and time pressures, following Van Yperen et al. (2015), we expected that the advantage of self-goals in behavioral engagement would not be evident, so that self-goals and other-goals would predict similar levels of accuracy improvement. However, we also expected other-goals would predict better speed improvement, because this measure fit the competitive nature of the goals, in which one's aim is to outperform others, while ignoring quality of performance. Finally, we expected the autonomy-supportive context would maximize the effect of self-goals on the quality of behavioral engagement, so that self-goals adopted in an autonomy-supportive context would predict better accuracy improvement than would other-goals or self-goals adopted in an autonomy-suppressive context. As for the self-reported engagement, we expected that an autonomy-supportive context would predict better effort than an autonomy-suppressive context, but no such effect was expected for the goal condition.

Method

Participants

The sample comprised 133 Israeli undergraduate students who participated in the study for credit in their introductory psychology course. They were randomly assigned to four groups: a self-goal condition was delivered in each of two contexts (autonomy-supportive and autonomy-suppressive) and an other-goal condition was delivered in each of the same two contexts.[1] Participants' mean age was 24.60 years, and 60% were women. Hebrew was the mother tongue for 81%, but all students could speak, read, and write Hebrew fluently.

Experimental procedure

To measure performance attainment, a computer game was developed using the Game Maker™ software. In the game, participants were asked to use the mouse to move a smile icon along a path while collecting gems. The game objective was to collect as many gems as possible in 30 s (with each gem scoring 1 point), while avoiding touching the sides of the path (with each mistake subtracting 1 point from the score). 123 gems were dispersed evenly along the path, and pilot examinations ascertained that no ceiling effect could occur; that is, collecting all gems in a timeframe of 30 s was impossible.

Self-goal condition

In this condition, after the first game, participants were asked to improve their performance in a second attempt. As in Benita et al. (2014), different improvement instructions were given verbally by the experimenter before the second game in each of the three contexts, autonomy-supportive, autonomy-suppressive, or neutral, as follows:

Autonomy-supportive context Instructions included several practices documented as autonomy-supportive: (1) acknowledging difficulties, (2) providing a rationale, and (3) using non-controlling language (Deci et al. 1994; Grolnick et al. 1997; Roth et al. 2009):

> The aim here is for you to master this task. We know it might not be very easy, but if you can show improvement, it will help clarify whether the task can serve as a flexible measure for the cognitive process we are interested in. So, see if you can do better than you did the last time.

Autonomy-suppressive context Instructions included controlling language, for example the use of verbs such as "should" and "have to," which research (Deci et al. 1994; Grolnick et al. 1997; Roth et al. 2009) has shown to predict controlled regulation and more negative feelings about the task at hand:

> What you should be doing here is trying to master this task. Your participation in the experiment will be valuable to us only to the extent that you can show clear improvement. So, now you will perform the task again, and to be helpful, you have to do better than you did the last time.

Neutral context Instructions were: "Try to do better than you did the last time."

Other-goal condition

In this condition, after executing the task once, participants were shown a fabricated percentiles graph, which supposedly presented their grade in relation to other participants. In fact, all participants received the same graph, displaying the same percentile of 75%. Then, participants were asked to improve their performance relative to other participants, so that they reached a higher percentile. Similar to the self-goal condition, instructions were given in three different ways before the second game:

Autonomy-supportive context Instructions again included documented autonomy-supportive practices:

> Please play again and try to do better than other participants, that is, to reach a higher percentile. We know it might not be very easy, but we ask it from you because it's a good way for us to assess this task for our research purposes. We are interested in

[1] Both experiments contained two neutral contexts (one for each goal), serving as control conditions. However, for the sake of brevity, these conditions have been removed from the manuscript. Interested readers may contact the authors and receive data that includes the neutral conditions.

whether you can do better than others in a second attempt of this task.

Autonomy-suppressive context Instructions for this context again included controlling language linked with controlled regulation:

> What you should be doing here is to do better than other participants, that is, to reach a higher percentile. We can only use the data of the best participants. So, now you will perform the task again, and in order to be helpful to us, you have to do better than other participants. You must outperform others.

Neutral context Instructions were: "Try to do better than other participants, that is, to reach a higher percentile."

Following the second computer game, participants completed three manipulation checks (for context, goal condition and perceived competence). Measures of emotional and behavioral engagement (pressure/tension and effort, respectively) were administered as dependent variables. The experiment was approved by the departmental institutional review board, and confidentiality was assured. The single session with each participant lasted approximately 15 min.

Measures

Context manipulation check

The 6-item experimental climate scale (ECS) was employed, following Benita et al. (2014), as a manipulation check to assess the degree to which participants perceived the experimenter as supportive versus suppressive of autonomy (e.g., "I felt understood by the experimenter"). Participants rated items on a 6-point Likert scale ranging from *Strongly disagree* (1) to *Strongly agree* (6). Based on factor analysis, the autonomy-suppressive items were reversed and combined with the autonomy-supportive items; thus, higher scores indicated higher perceived experimenter autonomy support. The Cronbach alpha was 0.82.

Sense of competence

A 5-item scale assessed self-perceived competence in the specific task (e.g., "I think I am pretty good at this activity;" Cronbach alpha = 0.80). This scale was used to ensure that the between-context differences could not be attributed to different levels of perceived competence. Therefore, we expected participants in both contexts would report similar levels of a sense of competence. Participants responded on a 6-point Likert scale ranging from *Not at all true* (1) to *Very true* (6).

Self- versus other-goal condition manipulation check

Two subscales of the Hebrew version of the 12-item Achievement Goals Questionnaire (AGQ; Elliot et al. 2011) were used to assess participants' self-approach (3 items, Cronbach alpha = 0.67) and other-approach (3 items, Cronbach alpha = 0.95) to the specific experimental task. These subscales were used to ensure that the participants differentially adopted self-goals and other-goals, in line with the experimental condition. The questionnaire's four other subscales measuring self-avoidance, task-approach, task-avoidance, and other-avoidance were not included because they were not relevant as a manipulation check in this study. Participants rated the items on a 6-point Likert-type scale ranging from *Strongly disagree* (1) to *Strongly agree* (6). We expected the mean comparisons among the self-reported self and other-goals would reflect the self and other-goals conditions; however, inasmuch as the intrapersonal aim of self-improvement was embedded in the experimental design characteristics (i.e. two consecutive games), we did not expect significant between-goal differences on the self-goal subscale scores. In addition, we expected that within both contexts, regardless of the goal condition, participants would adopt self and other-goals to the same extent.

Performance outcomes

Two dependent variables of behavioral engagement were derived from the game data. The sum of the gems collected was a measure of speed (quantitative behavioral engagement), as it indicated the extent of progress along the path within the given time (30 s). The sum of wall touches—mistakes—was a measure of accuracy (quality of engagement).

Self-report outcomes

Two subscales were used from the intrinsic motivation inventory (IMI; Deci et al. 1994; Ryan 1982) to assess participants' emotional experience and motivation during the experiment. A 4-item pressure/tension subscale was a measure of participants' emotional engagement during the experiment (e.g., "I felt very tense while doing this activity;" Cronbach alpha = 0.90). The 4-item effort subscale was a measure of participants' behavioral engagement (e.g., "I tried very hard on this activity;" Cronbach alpha = 0.72). For each subscale, participants responded on a 6-point Likert scale ranging from *Not at all true* (1) to *Very true* (6); thus, higher scores indicated higher pressure/tension and effort, respectively.

Table 1 Correlations among study 1's (above diagonal) and study 2's (below diagonal variables)

		Pearson *r*						
		1	2	3	4	5	6	7
1	Self-goals/task-goals	–	0.30**	0.15*	−0.14	0.18*	0.23**	0.01
2	Other-goals	0.08	–	−0.13	0.02	−0.13	0.15*	0.16*
3	Climate (ECQ)	0.15	−0.13	–	−0.03	0.12	0.21**	−0.27**
4	Δspeed/speed	0.03	−0.02	−0.07	–	−0.52**	−0.13	0.07
5	Δmistakes/mistakes	0.04	−0.09	−0.06	0.45**	–	0.01	−0.18*
6	Effort	0.25**	0.12	0.17*	−0.02	−0.13	–	0.25**
7	Pressure and tension	−0.10	0.03	−0.26**	0.03	0.06	0.10	–

In Study 1, there were two-task executions, whereas in Study 2 there was only one. Therefore, speed and number of mistakes variables in Study 1 represent the gap between the two task executions

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

Results

Table 1 shows zero order correlation among all study variables. Preliminary analyses using the Levene test found a significant departure from homogeneity of variance in the first game's number of mistakes across groups. Inspection of the distribution of the number of mistakes revealed two outliers (with mistakes more than 4 SD above the mean). Therefore, these subjects were removed from all analyses, leaving the experiment with a sample of 131 subjects. No other violations of homogeneity were found. Table 2 presents descriptive statistics for the manipulation check and the outcome measures.

Manipulation checks

The following manipulation checks confirmed the manipulations were adequate.

Goal condition check

To ensure that the goal-condition manipulation led participants to differentially adopt either a self- or other-oriented goal, we conducted a repeated measures two-way analysis of variance (ANOVA), with three measures: (1) the self-reported AGQ self-approach and other-approach subscales as the 2-level within-subject variable, (2) the experimentally manipulated goal condition (self-goal vs. other-goal) as a 2-level between-subjects factor, and (3) the experimentally manipulated context (autonomy support versus autonomy suppression) as a 2-level between-subjects factor. A significant main effect emerged for the within-subject AGQ variable, with a large effect size, F (1, 127) = 67.75, $p = .000$, $\eta 2 = 0.35$, indicating that all participants reported adopting self-goals more than other-goals. This significant effect was expected, as self-improvement was inherent in the task demand characteristics of the two consecutive games. In addition, an interaction effect with a large effect size emerged between the experimental goal-condition and the within-subject self-report variable, F (1, 127) = 25.52, $p = .000$, $\eta 2 = 0.17$. Thus, while participants in both goal conditions reported adopting self-goals more than other-goals, this difference was significantly higher for the self-goal condition ($M = 5.36$ for reported self-approach and 3.77 for reported other-approach) than for the other-goal condition ($M = 5.34$ for reported self-approach and 4.96 for reported other-approach). Finally, the interaction between the context (autonomy-supportive and suppressive) and the within-subject AGQ variable was significant, with a small effect size, F (1, 127) = 3.07, $p = .03$. This interaction suggests participants in the autonomy support group reported higher levels of self-goals and lower levels of other-goals ($M = 5.64$ for reported self-approach and 4.19 for reported other-approach) than participants in the autonomy-suppression group ($M = 5.25$ for reported self-approach and 4.50 for reported other-approach).

Context check

To examine differences in self-reported perceptions of autonomy support versus suppression among the experimentally manipulated contexts, we conducted a two-way ANOVA, using the mean of the manipulation check measure (ECS) as the dependent variable. A significant main effect emerged for context, F (1, 127) = 55.17, $p = .000$, $\eta 2 = 0.30$. As expected, participants in the autonomy-supportive context ($M = 4.73$, $SD = 0.76$, $p = .000$) reported higher levels of perceived autonomy support than participants in the autonomy-suppressive context ($M = 3.66$, $SD = 0.87$). The main effect for the experimental goal condition was non-significant, F (1, 127) = 1.67, $p = .199$, and

Table 2 Descriptive statistics of the six experimental groups and for each experimental factor in study 1

Experimental goal condition	Experimental autonomy context	*n*	Manipulation check of goal condition (AGQ)		Manipulation check of autonomy context (ECS)	Self-reported outcomes (IMI)		Performance outcomes			
								Speed		Mistakes	
			Self-approach	Other-approach		Pressure/tension	Effort	Time1	Time 2	Time1	Time 2
Means (and standard deviations) of study 1 variables for each of the six conditions											
Self-goals	Autonomy-supportive	33	5.46 (0.85)	3.39 (1.63)	4.90 (0.59)	3.07 (1.08)	4.79 (0.80)	65.61 (13.02)	67.42 (11.34)	2.63 (2.03)	1.82 (1.86)
	Autonomy-suppressive	34	5.27 (0.78)	4.14 (1.62)	3.67 (0.93)	3.63 (0.81)	4.63 (0.83)	68.76 (14.82)	72.06 (18.72)	2.97 (2.01)	2.88 (1.74)
Other-goals	Autonomy-supportive	30	5.48 (0.62)	5.06 (1.02)	4.54 (0.88)	3.53 (1.20)	4.69 (0.71)	63.90 (15.03)	70.57 (16.38)	2.77 (2.49)	2.45 (1.57)
	Autonomy-suppressive	34	5.22 (0.71)	4.87 (1.38)	3.65 (0.83)	3.86 (1.23)	4.69 (0.82)	64.15 (14.46)	71.35 (14.99)	2.77 (1.91)	3.35 (2.70)

AGQ achievement goals questionnaire, *ECS* experimental climate scale, *IMI* intrinsic motivation inventory

Numbers represent means and standard deviations (in parentheses)

no significant interaction effect was found between goal condition and context, F (1, 127) = 1.33, p = .251. [2]

Main analyses

The speed and number of mistakes inter-correlated positively and significantly in both tasks: in the first game, r = .37, p = .000, and in the second game, r = .33, p = .000. These correlations indicated, unsurprisingly, that faster performance was linked with a larger number of mistakes. As in Förster et al. (2003), the correlations demonstrated the existence of a speed-accuracy tradeoff in the data.

Next, we conducted a series of ANOVAs to examine the effects of context and goal on the outcome measures. First, to probe performance, we conducted two-way repeated measures analyses, with the speed score and the number of mistakes as the within-subject factors and the context and goal conditions as the between-subject factors. Overall, we found a significant within-subject effect for speed, F (1, 127) = 18.19, p = .000, η2 = 0.13, indicating that in all groups, participants collected approximately 4–7 gems more in the second attempt than in the first. The within-subject effect for number of mistakes was non-significant, F (1, 127) = 0.32, p = .573, indicating there was no consistent improvement in number of mistakes across the six groups. Second, for self-report measures, we conducted two-way ANOVAs with the IMI pressure/tension and effort scores as the outcome variables, and the context and goal conditions as the between-subject factors. In order to control for possible inflation caused by Type I error, we used a stricter alpha level of 0.025 as the cutoff point for significance among self-reported outcomes.

Context effects

For performance outcomes, the effect on speed of the interaction of the within-subject factor and the context was non-significant, F (1, 127) = 0.21, p = .651, and the effect of this particular interaction on number of mistakes was marginally significant, F (1, 127) = 3.31, p = .071, η2 = 0.03. Simple effects analysis using separate paired sample t-tests for each context revealed a significant improvement in number of mistakes among participants in the autonomy-supportive context (d = 0.57), t (62) = 1.77, p = .041, and a non-significant decline in number of mistakes in the autonomy suppressive context (d = −0.29), t (67) = −0.87,

[2] The ANOVA with goal condition and context as the independent variables and with level of perceived competence as the dependent variable yielded null results, F (1, 189) = 0.08, p < .78, F (2, 189) = 0.87, p = .423, F (2, 189) = 1.04, p = .357, for goal condition, context and the interaction effect, respectively, indicating that the context manipulation did not affect participants' sense of competence.

$p=.194$. When we turned to the self-report measures, a significant main effect on pressure/tension emerged, F (1, 127) = 5.772, $p=.018$, $\eta 2=0.04$, with participants in the autonomy-supportive context reporting lower levels of pressure/tension than participants in the autonomy-suppressive context ($M=3.29$, $SD=1.15$, and $M=3.74$, $SD=0.98$, respectively). The effect on effort was non-significant, F (1, 127) = 0.32, $p=.575$.

Goal induction effects

The interaction of the within-subject factor and the context had a marginally significant effect on speed, F (1, 127) = 3.87, $p=.051$, $\eta 2=0.03$. Although both groups significantly improved their speed in the second task execution (d = 6.95 for other-goals and d = 2.57 for self-goals), t (66) = 1.68, $p=.049$, t (63) = 4.35, $p=.000$, respectively, this improvement was greater in the other-goals condition. The interaction effect of the within-subject factor and the goal condition was non-significant for number of mistakes, F (1, 127) = 1.87, $p=.174$. A marginally significant main effect on pressure/tension emerged in the self-reported measures, F (1, 127) = 3.49, $p=.064$, $\eta 2=0.03$, with participants in the task-goal condition ($M=3.35$, $SD=0.99$) reporting lower levels of pressure/tension than those in the other-goal condition ($M=3.70$, $SD=1.16$). The effect on effort was non-significant, F (1, 127) = 0.02, $p=.893$.

Interaction effects between context and goal induction

The overall interaction effects on speed, number of mistakes, pressure/tension and effort were non-significant, F (2, 127) = 0.044, $p=.834$, F (1, 127) = 0.07, $p=.793$, F (1, 127) = 0.41, $p=.524$, F (1, 127) = 0.31, $p=.577$, respectively.

Summary of results

Generally, the results of Study 1 partially supported our hypotheses. Two main findings demonstrated the benefits of goal promotion in an autonomy-supportive context over an autonomy-suppressive context. First, whereas all groups showed speed improvement, only participants in the autonomy-supportive context also exhibited a decline in number of mistakes. Second, an autonomy supportive context was linked to lower self-reported pressure/tension than an autonomy suppressive context. Other-goals promoted better speed improvement than self-goals, but self-goals were marginally linked to less pressure/tension. We did not find the expected interaction effect, however, indicating that in this case at least, self-goals adopted in an autonomy-supportive context were the most adaptive form of goal adoption in performance-related behavioral engagement.

Study 2

In Study 2, we used a similar experimental design but manipulated task-goals (absolute standard) instead of self-goals (intrapersonal standard). In this experiment, we sought to manipulate task-goals in an accurate and clean design without involving an intrapersonal standard of competence. Because a repeated performance of a task automatically induces self-goals, which are aimed at self-improvement, we compared task-goals and other-goals adopted in two different contexts and measured speed and number of mistakes (accuracy) in one session instead of two. Elliot et al. (2011) found task-goals to be generally more adaptive than self-goals. Therefore, we expected the following outcomes: (1) Following Study 1, we expected a task-goal condition would predict less pressure/tension than an other-goal one and an autonomy-supportive context would predict less pressure/tension than an autonomy-suppressive one. (2) As in Study 1, we expected task-goals and other-goals would predict similar numbers of mistakes, but other-goals would predict higher speed than task-goals. In addition, following Study 1, we expected the autonomy-supportive context would predict fewer mistakes than the autonomy-suppressive context, but not better speed. Finally, we expected an autonomy-supportive context would maximize the effect of task-goals on qualitative behavioral engagement, so that task-goals adopted in an autonomy-supportive context would predict fewer mistakes than other-goals and task-goals adopted in an autonomy-suppressive context. We expected task-goals to benefit from the identification of the task characterizing the autonomy-supportive context, as this would allow task-goals to compensate for the costs of time pressures and feedback anticipation. As for self-reported engagement, we expected an autonomy-supportive context would predict better effort than an autonomy-suppressive one, but no such effect was expected for the goal condition.

Method

Participants

The sample comprised 129 Israeli undergraduate students who participated in the study for credit in their introductory psychology course. They were randomly assigned to four groups, where each of the two goal conditions was delivered in the two contexts as in Study 1. Participants' mean age was 23.62 years, and 70% were women. Hebrew was the mother tongue for 98%, and all students could speak, read, and write Hebrew fluently.

Experimental Procedure

The procedure was identical to Study 1 but after the practice trial, participants played the computer game only once.

Other-goal condition

After the practice trial, participants in this condition were shown a fabricated percentiles graph, as in Study 1, ostensibly depicting their success on the practice trial in relation to other participants (75th‰). It was emphasized that this was only a practice, and their performance in the following task was what we were interested in. Then they were told that their aim in the game was to be better (reach a higher percentile) than other participants. The two sets of verbal instructions—reflecting the two contexts—were identical to Study 1 except they did not refer to a second attempt at the task.

Task-goal condition

Before executing the task, participants were asked to master the game. In the task-goal condition, instructions for the three different contexts were as follows:

Autonomy-supportive context The instructions included several practices documented as autonomy-supportive, as in Study 1, but in this case, they focused on mastery of one game instead of improvement:

> The aim here is for you to master this task. In order for us to learn whether we can further use this game, we need to see whether people can master it. We know in might not be very easy, but if you succeed, it will help clarify whether we can further use this task.

Autonomy-suppressive context The instructions included controlling language as in Study 1, but they focused on mastery of one game instead of improvement:

> What you should be doing here is trying to master this task. Your participation in the experiment will be valuable to us only if we see that you tried hard enough to master this task. So now play, and remember that you have to master this task.

Neutral context Instructions here were: "Your goal is to master this task. Please start."

Measures

Study 2 used the same behavioral and self-reported measures as Study 1, with one exception. Inasmuch as we were manipulating task-goals, the manipulation check included the other-approach subscale of the AGQ (Elliot et al. 2011) as before, but we replaced the self-approach subscale with the task-approach subscale. The Hebrew version of this 3-item AGQ subscale assessed participants' task-approach goals (e.g., "My aim was to completely master the task at hand") for the specific experimental task. Participants rated the items on a Likert-type scale ranging from *Strongly disagree* (1) to *Strongly agree* (6). The Cronbach alphas were 0.68 for task-approach and 0.97 for other-approach. This scale was used to ensure participants differentially adopted task-goals and other-goals. As in Study 1, because all participants were instructed to master the game, we expected participants in both goal conditions would adopt task-goals to a similar degree. At the same time, we expected a significantly higher mean for the other-approach orientation in the other-goal condition than in the task-goal condition. We did not expect between-group differences with respect to context.

Results

Table 1 shows zero order correlation among all study variables. Preliminary analyses using the Levene test found a significant departure from homogeneity of variance in the effort scores across groups. Inspection of the distribution of the effort scores revealed one outlier (with mistakes scores of more than 3.5 SD below the mean). Therefore, this subject was removed from further analyses, leaving a sample of 128 subjects. No other violations of homogeneity emerged. Table 3 presents descriptive statistics for the two self-reported manipulation checks and the outcome measures.

Manipulation checks

The following manipulation checks confirmed the manipulations were adequate.

Goal condition check

To ensure the goal-condition manipulation led participants to adopt a goal corresponding to the condition, we conducted a repeated measures two-way ANOVA, with the self-reported AGQ task-approach and other-approach subscales as the 2-level within-subject variable, with the experimentally manipulated goal condition (task-goal vs. other-goal) as a 2-level between-subjects factor, and with the experimentally manipulated context (autonomy support versus autonomy suppression) as a 2-level between-subjects factor. A significant main effect emerged, with a large effect size, for the self-reported AGQ variable, F (1, 124) = 138.88, p = .000, η2 = 0.53, indicating that all participants reported adopting task-goals more than other-goals. This effect was expected given the demand characteristics, with all

Table 3 Descriptive statistics of the six experimental groups and for each experimental factor in study 2

Experimental goal condition	Experimental autonomy context	*n*	Manipulation check of goal condition (AGQ)		Manipulation check of autonomy context (ECS)	Self-reported outcomes (IMI)		Performance outcomes	
			Task-approach	Other-approach		Pressure/tension	Effort	Speed	Mistakes
Means (and standard deviations) of self-reports and speed for each of the six conditions									
Task-goals	Autonomy-supportive	34	5.65 (0.45)	3.22 (1.55)	5.30 (0.53)	3.28(1.12)	5.01 (0.62)	47.38 (14.42)	2.74 (1.83)
	Autonomy-suppressive	32	5.84 (0.39)	3.72 (1.53)	4.14 (0.66)	3.35 (1.02)	4.88 (0.57)	45.03 (12.16)	3.97 (2.74)
Other-goals	Autonomy-supportive	30	5.57 (0.53)	4.88 (1.18)	4.95 (0.59)	3.79 (1.02)	4.91 (0.62)	50.07 (8.30)	4.23 (2.57)
	Autonomy-suppressive	32	5.60 (0.52)	5.16 (1.06)	4.19 (0.76)	3.62 (1.01)	4.62 (0.63)	47.28 (11.67)	3.38 (2.47)

AGQ achievement goals questionnaire, *ECS* experimental climate scale, *IMI* intrinsic motivation inventory

participants instructed to master the task in a single attempt. An interaction effect with a large effect size emerged between the goal condition and the within-subject variable, F (1, 124) = 50.10, p = .000, η2 = 0.29. Thus, while participants in both goal conditions reported adopting task-goals more than other-goals, this difference was significantly higher in the task-goal condition (M = 5.74 for reported task-approach and M = 3.46 for reported other-approach) than in the other-goal condition (M = 5.59 for reported task-approach and M = 5.02 for reported other-approach). The interaction between the context and the within-subject variable was non-significant, F (1, 124) = 1.28, p = .259.

Context check

To examine differences in self-reported perceptions of autonomy support versus suppression in the two experimentally manipulated contexts, we conducted a two-way ANOVA, using the mean of the manipulation check measure (ECS) as the dependent variable. As expected, a significant main effect for context emerged, F (1, 124) = 71.23, p = .000, η2 = 0.37. Participants in the autonomy-supportive context (M = 5.14, SD = 0.58) reported higher levels of perceived autonomy support than participants in the autonomy-suppressive context (M = 4.17, SD = 0.71). Perceptions of the experimenter as autonomy-supportive did not vary by goal condition, F (1, 184) = 1.19, p = .276 (task-goals: M = 4.80, SD = 0.78; other-goals: M = 4.68, SD = 0.72), and we found no significant interaction effect, F (2, 184) = 1.95, p = .146. [3]

[3] Testing differences among conditions on the level of perceived competence yielded null results, F (2, 184) = 0.93, p = .393, F (1, 184) = 0.81, p = .370, F (2, 184) = 0.59, p = .553, for goal conditions, context and interaction effect, respectively, indicating that the context manipulation did not affect participants' sense of competence.

Main analyses

The speed and number of mistakes measures were positively and significantly correlated, r = .46, p = .000. As in Study 1, this correlation demonstrated the existence of a speed-accuracy tradeoff in the experimental task.

Next, we conducted a series of two-way ANOVAs to examine the effects of context and goal on the outcome measures; speed, number of mistakes, pressure/tension and effort served as outcome measures, and context and goal conditions served as between-subject factors. To control for inflation caused by Type I error in the self-report measures, we used a stricter alpha level of 0.025 as the cutoff point for significance among the self-reported outcomes.

Goal induction effects

With respect to performance outcomes, the main effects of the goal conditions on speed and number of mistakes were non-significant, F (1, 124) = 1.36, p = .245, F (1, 124) = 1.18, p = .293, respectively. When we turned to the self-reported measures, a marginally-significant effect on pressure/tension emerged, F (1, 124) = 4.41, p = .038, η2 = 0.03, with participants in the task-goal condition (M = 3.31, SD = 1.07) reporting lower levels of pressure/tension than those in the other-goal condition (M = 3.70, SD = 1.01). The main effect on effort was non-significant, F (1, 124) = 2.72, p = .102.

Context effects

The main effects of the context conditions on speed and number of mistakes were non-significant, F (1, 124) = 1.48, p = .226, F (1, 144) = 0.19, p = .662. In the self-reported measures, we found a marginally significant main effect on

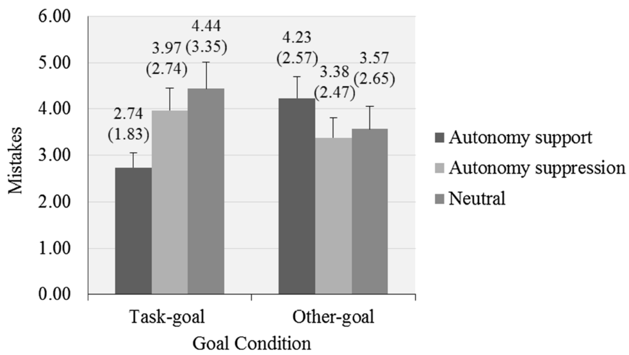

Fig. 1 Study 2: Interaction of context and goal condition on number of mistakes. *Numbers* represent exact means, with standard deviations in parentheses

effort, F (1, 124) = 3.83, p = .053, η2 = 0.03, indicating that participants in the autonomy-supportive context (M = 4.83, SD = 0.71) reported higher effort than participants in the autonomy-suppressive context (M = 4.63, SD = 0.68). Surprisingly, the effect on pressure/tension was non-significant, F (1, 124) = 0.08, p = .783.

Interaction effects between goal induction and context

The interaction effect of the goals and context conditions on speed was non-significant, F (1, 124) = 0.01, p = .918. However, a significant interaction effect appeared for number of mistakes, F (1, 124) = 5.98, p = .016, η2 = 0.05 (see Fig. 1). Planned contrasts revealed a significant effect between task-goals and other-goals in the autonomy-supportive context, F (1, 62) = 7.34, p = .009, η2 = 0.11, but not in the autonomy-suppressive context, F (1, 62) = 0.83, p = .366. These results suggested participants in the task-goal condition made fewer mistakes than those in the other-goal condition only when the context was autonomy-supportive. The interaction effects on pressure/tension and effort were non-significant, F (1, 124) = 0.44, p = .507, F (1, 124) = 0.54, p = .464, respectively.

Summary of results

Study 2 yielded several interesting findings. First, as in Study 1, other-goals were marginally linked to more pressure/tension than were task-goals, but no such effect was found for context. Unlike Study 1, however, neither the context nor the goal had a main effect on number of mistakes. Second, unlike the findings for self-goals in Study 1, the performance measures of behavioral engagement in Study 2 supported the hypothesis that task-goals adopted in an autonomy-supportive context would predict better qualitative behavioral engagement (optimal accuracy) than task-goals adopted in an autonomy-suppressive context, and compared to other-goals adopted in each of the two contexts explored. Finally, unlike Study 1, the autonomy-supportive context led to more effort than the autonomy-suppressive context.

Discussion

The development of the hierarchical model of achievement motivation (Elliot and Thrash 2001) generated interest in the integration of SDT concepts with achievement goal theory (Vansteenkiste et al. 2014). The current research has taken model development a step farther by directly comparing the effects of inducing mastery and performance goals in different motivational contexts. Furthermore, while previous studies have relied exclusively on self-reported outcome measures, this research has examined both self-report and behavioral outcomes. Finally, following Elliot et al. (2011), this represents the first study to explore effects of task-goals and self-goals separately in an experimental design.

Goal induction effects

The study's findings on the effects of mastery goals (self-goals and task-goals) vs. performance-goals (other-goals) are mixed. When we tested quantity of behavioral engagement (i.e., speed), in Study 1, we found other-goals yielded better performance than self-goals, but this effect was not replicated In Study 2. As expected, no main effect emerged for quality of behavioral engagement (i.e. accuracy or number of mistakes). But for pressure/tension, both studies demonstrated marginally significant differences between the goals, with both favoring self-goals and task-goals over other-goals.

Overall, these results suggest that while the induction of other-goals may promote better quantitative engagement (i.e., speed) than self-goals, they also lead to more negative emotions. These results agree with previous studies finding performance goals are related with more negative emotions than are mastery goals on the one hand (e.g., Dewar et al. 2013; Elliot and McGregor 1999), and with better short-term and instrumental performance on the other (e.g., Elliot et al. 2005). Importantly, the different designs used in each study preclude the possibility of comparing the effects of speed on self-goals versus task-goals. Thus, the lack of effect on speed in Study 2 may be attributable to the experimental design, namely the execution of a single task. Future studies should include both self-goals and task-goals in one experiment.

Another caveat concerns the manipulation checks, which, in both experiments, yielded significant differences only for self-reported other-goals. Arguably, the other-goals manipulation was not "clean", because it involved both other-goals and self/task-goals. Thus, it is possible that the lack of other-goals in both the self and task-goal conditions caused the rather small effect sizes, not a true mastery-performance distinction. Although this is a possible explanation of our findings, it is important to note that strength of the research is its use of continuous variables as the manipulation checks. Most studies that have experimentally manipulated achievement goals have used dichotomous manipulation checks in which participants were asked to choose, using a binary question, whether they adopted each goal or were induced to do so (e.g., Anseel et al. 2011; Elliot et al. 2005). Researchers have long maintained that pursuing multiple goals is likely to be the rule rather than the exception (e.g., Pintrich 2000), however, and this study's manipulation checks reflect more accurately the actual goals adopted by participants when carrying out experimental tasks. Previous experimental studies using similar manipulation checks have found similar results (e.g., Spray et al. 2006).

Context and goal by context effects

Generally, Study 1 showed a more consistent pattern of results favoring the autonomy-supportive context over the autonomy-suppressive context. In Study 1, the autonomy supportive context *per se* was linked to both better qualitative engagement and less pressure/tension than the autonomy-suppressive context, but no such effect was found in Study 2. In Study 2, autonomy-support was linked with more self-reported effort than was autonomy-suppression. Again, this differential set of outcomes might be the result of the different experimental designs used in each of the studies. This should be addressed in future work.

A main hypothesis of the research was that an interaction effect would emerge; only mastery goals adopted in an autonomy-supportive context would lead to better qualitative behavioral engagement than performance goals. This expected result was obtained only in Study 2, where mastery goals were defined as absolute standards (i.e., task-goals). This interaction effect suggests that both task-goal induction and an autonomy-supportive context are necessary to facilitate quality of engagement. Future studies would do well to replicate this finding, both experimentally and in naturally occurring settings, such as school or work.

This last suggestion touches on an important limitation of the research, namely its exclusive reliance on experimental designs. Specifically, the behavioral measures were represented by artificial tasks with little meaning to individuals. In addition, some of the non-significant findings in both experiments, specifically in the self-report measures, could have also resulted from the relatively short task-engagement, which lasted only 30 s. Possibly, this limited the emotional impact of the task, in a way that might have prevented the emergence of between-group differences. Future studies would do well to use longer and more meaningful tasks.

In Study 1, the expected interaction effect was non-significant. When mastery goals were defined as intrapersonal standards of competence, their combination with an autonomy-supportive context did not facilitate behavioral engagement. This null effect might be explained in light of Elliot et al. (2011) finding that self-goals predicted less adaptive learning outcomes than task-goals, and only task-goals predicted better learning outcomes than other-goals. Previous correlational studies' finding that mastery goals with underlying autonomous reasons were more adaptive than those with underlying controlled reasons have merely measured mastery goals as task-based (absolute) standards (Benita et al. 2014; Gaudreau 2012; Gaudreau and Braaten 2016; Michou et al. 2014). Also, Delrue et al. (2016), who measured only self-goals, did not find this interaction effect. Therefore, the finding that self-goals did not have a behavioral advantage over other-goals, even when interacting with autonomy support, fits current knowledge on the differentiated effects of the goals.

Implications

These results may account for inconsistent findings linking mastery goals with better engagement than performance goals (e.g., Harackiewicz et al. 2002) and may suggest a way for these goals to foster optimal performance. Like previous studies conducted in the field of achievement motivation (e.g., Bereby-Mayer and Kaplan 2005; Elliot et al. 2005), our findings suggest that the induction of mastery goals yields positive behavioral outcomes only for tasks that require high quality of engagement. In addition, they demonstrate the advantages of autonomy-supportive context on quality of behavioral engagement, thus replicating previous findings (e.g., Vansteenkiste et al. 2004). Importantly, the comparisons among the groups' sense of competence suggest the results cannot be attributed to this phenomenon.

These results contribute to both the achievement goal theory and the SDT literatures. Specifically, the use of a speed-accuracy tradeoff measures sheds light on how both goals and motivational contexts relate to quality of performance. With regard to achievement goal theory, the results support the claim that mastery goals involve a better emotional experience than performance goals but are not necessarily related to better behavioral outcomes. Arguably, because Study 1 indicated that other-goals induction leads to an improvement in speed self-goals, adopting other-goals, regardless of the specific context, might sometimes be beneficial because these goals may promote more effort. However, the consistent finding of their linkage with higher levels of pressure/tension casts doubt on this conclusion; although they may promote quantitative behavioral engagement under certain circumstances, they could come at a significant emotional cost and undermine quality of engagement.

These results may seem inconsistent with those of a host of recently published studies, with the latter indicating the adoption of performance goals predict more positive outcomes when the reasons underlying their adoption are autonomous, rather than controlled (Michou et al. 2014; Vansteenkiste et al. 2010a, b). However, these inconsistencies may be explained by referring to both the SDT and the achievement goals literatures. From an SDT perspective, previous studies focused on the autonomous and controlled reasons for adopting goals, whereas ours focused on the autonomy-supportive and autonomy-suppressive (controlling) contexts in which goals are adopted. Considerable research in the SDT tradition has differentiated between autonomous motivations and the socialization contexts that foster or undermine them (e.g., Deci and Ryan 2000; Reeve et al. 2004; Reeve and Jang 2006). Although people can pursue performance goals for autonomous reasons, we suggest it is much more difficult for socialization agents to promote these goals in an autonomy-supportive way. Future research should explore this suggestion.

Following Benita et al. (2014), our research focused on the context to which goals are adopted. Based on our findings, we suggest that promoting achievement goals in an autonomy-supportive context will have an influence on various learning outcomes by facilitating autonomous motivations. The results echo recent findings that autonomous reasons underlying goal adoption predict better learning outcomes than controlled reasons (Vansteenkiste et al. 2014). We contend that the relation between achievement goals adopted in an autonomy-supportive context and behavioral engagement will be mediated by the autonomous reasons that accompany the goals' adoption. To date, no work has explored the contexts and reasons underpinning goal adoption; this would be an interesting topic for future research.

Despite their limitations, the results have a number of practical implications. For one thing, they support the claim that it is important to consider both the specific goals being promoted and the context in which they are promoted. The induction of mastery goals (self and task-goals) seems to yield more consistent benefits than the induction of performance (other) goals. Thus, in accordance with previous achievement-goal theory assumptions (e.g., Ames 1992; Midgley et al. 2001), the results suggest socialization agents should foster mastery goals rather than performance goals in various achievement-related settings, such as school and work. However, the results also indicate that an autonomy-supportive context is no less important than the specific goals being induced. Thus, while socializing agents may promote certain goals, they can do so in either controlling or autonomy-supportive ways; both influence the goals' effects on behavioral and emotional outcomes. Finally, in some cases, an autonomy-supportive context could be a necessary precondition without which mastery goals will not show benefits over performance goals in behavioral engagement.

Summary

This work contributes to a recent line of research using the notion of goal-complexes to integrate achievement goal theory with SDT. The findings replicate and strengthen previous results and expand the knowledge base on the relations between achievement goals, motivational contexts, and various outcomes. More generally, the results support the claim that when considering achievement goals' outcomes, researchers should also consider the context in which the goals are adopted, as this, in itself, predicts outcomes.

Compliance with ethical standards

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Human and animal participants This article does not contain any studies with animals performed by any of the authors.

Informed consent Informed consent was obtained from all individual participants included in the study.

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