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Long Term Effects of Positive Affect During Goal Adoption

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Long Term Effects of Positive Affect During Goal Adoption

A Thesis
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In Partial Fulfillment
of the Requirements for Graduation Honors

Katherine E. Adams
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Abstract

Prior research has demonstrated that positive affect can facilitate goal achievement, typically by having an ‘energizing’ effect during goal pursuit. However, a recent study (Wainwright, 2011) suggested that positive affect may also result in improved goal achievement if it is experienced specifically at the time of goal adoption. The present study, which was conducted in two sessions, examined whether positive affect during goal adoption can still facilitate later performance on a mental rotation task after a substantial delay period. During the first session, participants were first induced into either a positive or a neutral affective state using video clips. Participants then were either asked to adopt an explicit goal to perform well on a mental rotation task, or they were merely exposed to the task without explicit goal adoption. During the second session, which occurred one week later, participants actually completed the mental rotation task, and their performance was analyzed in terms of speed and accuracy. Participants who explicitly adopted the goal in a positive mood performed marginally significantly better than those who explicitly adopted the goal in a neutral state. However, the former group did not perform better than participants who were merely exposed to the task and did not explicitly adopt the goal. This study provides supportive evidence that positive affect during goal adoption facilitates later goal performance.
Long Term Effects of Positive Affect During Goal Adoption

Positive emotions, such as joy, amusement or contentment are an important and much sought after part of our everyday existence. In addition, a number of positive life outcomes, such as having high self-esteem, job satisfaction, and a comfortable income, appear to lead to increased levels of positive emotions (Myers, & Diener, 1995). However, although positive affect has traditionally been studied as an outcome, more recent research indicates it may also play a critical role as a determinant of our actions and thoughts (Forgas, 2008; Lyubomirsky, King, & Diener, 2005).

In particular, positive affect has been shown to facilitate a number of cognitive phenomena (for a review, see Clore & Huntsinger, 2009). For example, people in positive as opposed to negative moods are more likely to experience semantic priming (Storbeck & Clore, 2008), meaning that they are faster to respond to a target word (i.e., winter) when it follows a semantically related word (i.e., snow) as opposed to an unrelated word (i.e., desk). Additionally, positive affect can prompt a global as opposed to local processing style (Gasper & Clore, 2002), meaning that participants in a positive mood are more likely to view the “whole picture” whereas participants in a negative mood are more likely to attend to the details. In addition, positive affect has also been shown to consistently promote flexible and creative thinking styles (Isen, 1990; Isen, Daubman & Nowicki, 1987).

The findings of these and similar studies have been integrated into the “Broaden-and-Build” theory (Fredrickson, 2001), which posits that positive affect both broadens and builds cognitive resources. This theory has been supported by numerous studies.
showing that people in a positive mood can and do think more flexibly and broadly than those in a neutral or negative mood (Fredrickson & Branigan, 2005; Johnson, Waugh & Fredrickson, 2010). Moreover, the ‘broadening and building’ aspect of positive emotions appears to be beneficial and has consistently been linked to increased resilience over the long term. This has been suggested by research showing that individuals predisposed to high levels of positive affect recover more quickly from stressful experiences (Fredrickson, 2001), and as a result, experience more resilience and greater life satisfaction over time (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009).

In addition to positive affect’s broadening effects on cognitive processing, it may also have more specific effects on goal formation and pursuit. Positive emotion stimulates an approach motivation – or an urge to go toward an object or person – as opposed to a withdrawal or avoidance motivation (Gable & Harmon-Jones, 2008). Positive affect has also been shown to increase intrinsic motivation for pursuing a task, or pursuing a goal for its own sake, as opposed to extrinsic motivation, or pursuing a goal to meet an end (Isen & Reeve, 2005). Participants who experienced positive affect during a mildly interesting task later rated that task as more enjoyable and spent more time on this task during a free choice interval than did participants who were in a neutral mood. Thus, positive affect increased actual enjoyment during the activity itself, leading to enhanced persistence.

Positive affect also seems to provide a general “yes” signal for pursuing an action, which promotes goal pursuit. This has been demonstrated by the “mood-as-information” hypothesis (Schwarz & Clore, 1983; Clore, Schwarz, & Conway, 1994) which proposes that an individual’s mood state can serve as an informational heuristic that can then be
used to inform judgment and decision-making processes. According to this hypothesis, positive affect acts as a “safety” or “go” signal that can in turn foster goal adoption. For example, in one series of experiments, Fischbach and Labroo (2007) varied the accessibility of either a self-improvement or a mood-maintenance goal and found that happy participants tended to pursue whichever goal had been made more accessible. For example, participants in a happy mood donated significantly more money to charity than those in a negative mood if a “be a better person” goal was made salient, but donated significantly less if a “feel better” goal was made salient. Thus, positive affect seemed to function as a “go” signal for whichever goal was more accessible at the time.

This is consistent with a large body of work showing that goal pursuit is facilitated if the goal concept is linked unconsciously to positive affect. Custers and Aarts (2005) showed that when participants were subliminally exposed to positive words during task performance, as opposed to neutral or negative words, their motivation was higher for completing a dot detection task. In a separate set of studies, participants adopted a goal that was subliminally paired with either positive or neutral words, and were then asked to estimate the size of various objects. Participants later rated goal-related objects as larger if the goal had originally been paired with positive as opposed to neutral words. This was interpreted to mean that when the goal was paired with positive affect, participants had increased motivation to pursue their goal which resulted in a top-down processing bias to rate the goal-related objects as larger. (Aarts, Custers, & Veltkamp, 2008). Cappa, Cleeremans, Bustin, Bouquet and Hansenne (2011) demonstrated that linking a goal to positive affect also has effects on a physiological level. When the goal of studying was paired with subliminally primed positive words,
participants later showed greater cardiovascular reactivity during a learning task, suggesting that they were engaged in more effortful behavior. Interestingly, negative affect appears to have opposite effects and can inhibit motivation and goal pursuit. This was demonstrated by Aarts, Custers and Holland (2007) in a series of experiments in which participants were shown to have decreased accessibility to the goal of socializing, as measured by a lexical decision task, after subliminally pairing this goal with negative as opposed to neutral words.

So, how might positive affect be affecting goal behavior? The traditional explanation has been that positive affect has an ‘energizing’ effect during task performance – it increases intrinsic motivation and task enjoyment, both of which foster persistence (Isen & Reever, 2005). However, this explanation requires that a person be in a positive mood during actual goal pursuit in order to reap the benefits of positive affect.

In contrast to the ‘energizing effect,’ another, more cognitively-based explanation is also possible. This proposed explanation is consistent with the large body of work demonstrating that positive affect can directly affect cognitive processes. Specifically, positive affect may work to facilitate a process called spreading activation (Clore & Huntsinger, 2007; Storbeck & Clore, 2008; Kuhbandner, Pekrun, & Maier, 2010).

Spreading activation theory (Quillian, 1967; Collins & Loftus, 1988) proposes that concepts and ideas in memory can be represented as “nodes” which are often linked together, creating complex networks. However, not all nodes are linked together, and some nodes may be more closely or strongly linked together than others. For example, “tree” and “oak” would be very closely related, whereas “tree” and “paper” might not be as closely linked. When one node is activated (e.g., by thinking about the concept
represented by the node), this activation spreads to other connected nodes within the network, spreading first to those nodes that are most closely connected and then moving outward (Collins & Loftus, 1988).

The reason spreading activation is relevant is because being in a good mood during goal adoption (i.e., when deciding to make something a goal) may have important implications for how the adopted goal becomes linked to other nodes in memory. In keeping with Frederickson’s “Broaden-and-Build” theory, positive affect experienced at the time of goal adoption may have a ‘broadening’ effect, such that the newly adopted goal will become linked to a larger number of nodes within the network. In theory, increasing the number of nodes that the goal becomes linked to also increases the likelihood that the goal will be activated. Activated goals, in turn, produce goal-related behavior, which facilitates goal achievement. Additionally, or perhaps alternatively, positive affect experienced during goal adoption may become associated with or ‘color’ the goal such that the goal concept may then become connected to other nodes that are also associated with positive affect. Thus, when the goal is activated, other positively-valenced nodes become activated, such as the rewards that would be attained upon goal completion. Negative concepts that would impede devoting effort toward the goal (e.g., potential obstacles, imagining the time and effort the goal would require, etc.) should be much less likely to become activated. This cognitive explanation, although speculative, would be consistent with research demonstrating that positive affect facilitates priming generally (Storbeck & Clore, 2008), and goal accessibility specifically (Fishbach & Labroo, 2007).
Although much research has examined the relationship between positive affect and goal pursuit, there is little work specifically examining the role that positive affect might play during goal adoption. Wainwright (2011), however, does provide some initial evidence supporting the claim that positive affect during goal adoption itself can facilitate later performance. In this study, participants were first induced into either a neutral or positive mood and then asked to adopt a goal to perform well on a mental rotation task. After a short delay intended to allow participants to return to a baseline mood, participants then completed the mental rotation task. Participants in the positive affect condition did indeed perform better on this task than their neutral affect counterparts; however, the relatively short delay did not allow all participants to return to a baseline mood before completing the task. Thus, the ‘energizing effect’ explanation could not be entirely ruled out in this study.

Research capable of definitively determining the effects of positive affect during goal adoption is needed. Additionally, assuming positive affect during goal adoption facilitates goal attainment, several other issues should also be addressed. Firstly, it remains unclear if one must explicitly adopt a goal in order to reap the benefits of positive affect. Perhaps positive affect occurring anywhere in the temporal vicinity of merely considering a goal is sufficient to enhance performance. Secondly, as mentioned earlier, Wainwright (2011) used only a short delay period between goal adoption and goal performance. Wainwright (2011) also did not address the potential long term effects of positive affect during goal adoption. Can positive affect experienced during goal adoption still facilitate goal performance if one must wait several days before pursuing the goal? This is an important question because often in everyday life it is impossible to complete a
specific goal only a few minutes after its adoption. By adding a control condition in which a goal is not explicitly adopted, as well as a week-long delay period between the time of goal adoption and actual goal pursuit, this study will attempt to fill in these gaps in the literature and better identify the role that positive affect might play during goal adoption.

Method

Overview

For this study, which was conducted in two sessions, participants were first randomly induced into either a positive or neutral mood before being introduced to a mental rotation task. Also during this first session, participants were randomly assigned to either simply read about the task or to explicitly form a goal to perform well on this task. During the second session, which occurred one week later, participants returned and preformed the mental rotation task. Performance on this task constituted the study’s primary dependent variable, and was assessed in terms of both speed and accuracy. In addition to addressing whether positive affect during goal adoption facilitates performance a week later, this design also allowed us to determine whether explicitly adopting a goal is necessary to reap the facilitative effects of positive affect or whether such effects are simply due to a more general effect of positive affect.

Participants

Eighty-four participants (19 male, 65 female) from Butler University undergraduate psychology classes participated in this study, and they received extra credit as incentive for their participation. Participants ranged in age from 18 – 22 years
with a mean age of 19.5 years ($SD = 1.36$). Participants also ranged from their first to fourth years of study with a mean year of 2.02 ($SD = 1.16$). The racial composition of the sample was 88% Caucasian, 1% Latino/Hispanic, 4% Asian/Oriental/Pacific Islander, 1% American Indian, and 1% mixed ethnicities.

Procedure

Once participants arrived at the lab, they were given a brief overview of the study and asked to fill out the informed consent. Participants were told that they would be completing two, unrelated studies. For the first study, participants learned that they would be judging certain film clips, ostensibly to evaluate them as material for future studies. For the second study, participants were told that Butler University was participating in a national investigation of college students’ cognitive abilities, and that, as part of this study, they would be completing a mental rotation task on the computer. This mental rotation exercise has been used successfully in a previous study addressing goal adoption (Wainwright, 2011).

As part of the first study, participants were randomly assigned to watch either a funny video designed to induce positive affect (i.e., laughing babies) or a relatively boring video designed to induce a neutral mood (i.e., bird-watching). Video assignment (positive or neutral) constituted the first independent variable. These videos have been used successfully in a previous study to induce the appropriate mood (Wainwright, 2011).

After explaining the two studies, the experimenter then noted the video rating questionnaire was ‘missing’ and explained that it would be necessary to go print another questionnaire. Before leaving the room to print out the questionnaire, however, the
experimenter instructed the participant to go ahead and watch the video. The experimenter also handed the participant a packet that contained instructions for the supposed national study, and explained that the participant should read over these instructions if he or she finished the video before the experimenter returned.

Each of these packets contained a brief overview of the ‘national study’ and a description of the mental rotation task that would supposedly be used to measure cognitive ability. Included in this description were samples of the computer screens intended to help participants familiarize themselves with the task. However, each participant had been randomly assigned to receive one of two versions of this packet. Half of these packets contained instructions that encouraged the participant to explicitly adopt the goal to perform well on the mental rotation task by explaining that top-performing schools in the national study would have an opportunity to earn extra funding. It was therefore important that the participant perform his or her best in order to represent Butler well and help Butler achieve this opportunity. The other half of the packets contained similar information about the national study, but explained that each participants’ performance would not be connected with Butler in any way and no mention was made of Butler potentially receiving any extra funding. Therefore, there was little incentive for the participant to explicitly adopt the goal to perform well on the mental rotation task. This manipulation (goal vs. no goal) constituted the study’s second independent variable. Prior to the participant’s arrival, the two types of packets were shuffled to ensure that each participant was randomly assigned to receive either the “goal” or “no goal” condition and to blind the experimenter to each participant’s status.
The reason the experimenter was not present while the participant watched the video, read the packet and adopted the goal (or was exposed to the task) was to reduce experimenter effects and demand characteristics. After giving the participant sufficient time to both watch the video and read the instructions for the national study, the experimenter returned to the lab with the questionnaire to assess the participant’s reaction to the video. This questionnaire, which served as a manipulation check, asked participants to rate the video on how funny, boring, entertaining, stimulating and laugh-provoking it was. For each adjective, participants were asked to rate the video on a 7-point Likert-type scale ranging from “Definitely Disagree” to “Definitely Agree.”

Once participants had completed this assessment, the experimenter first confirmed with each participant that he or she had in fact read about the second study and then went on to clarify the study further. Specifically, the experimenter explained that the national study had been set up in such a way that it needed to be completed in two separate parts. Participants were only allowed to be introduced to the national study at the first meeting, and they would need to come back a week later in order to actually perform the mental rotation task. (All participants had initially signed up for two time-slots at one week apart, so the fact that they would need to return to the lab in order to complete the study was not a surprise.)

Participants returned to the lab one week later and were seated in a different room than the one in which they originally completed session one. This was done to minimize potential context-dependent effects. In other words, memories of the original room may have “reactivated,” to an extent, the state that participants were in after first watching the video manipulation. The experimenter reminded participants of the supposed “national
study” they would be completing at this session, and checked to make sure the participant understood the instructions for the mental rotation task. Samples of the computer screens were again provided to help participants familiarize themselves with the task. Participants then filled out the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988). They also completed three items that were designed to assess participants’ level of goal commitment as a manipulation check for the goal manipulation they received a week earlier. Participants were asked to rate their motivation to perform well on the task, as well as their overall desire to perform the task, on a 7-point Likert-type scale anchored with “Not at all” and “Highly.” Participants were also asked how much they agreed with the statement: “I really want to do well on this task,” on a 7-point Likert-type scale anchored with “Definitely Disagree” and “Definitely Agree.”

After completing these questionnaires, participants then performed the mental rotation task on the computer. This task required participants to decide whether two images presented on the screen were identical or mirror images of each other. Because the images were shown rotated at different angles, the participant had to mentally “rotate” the images in order to make a correct judgment. Participants completed a total of 30 trials, and their performance on this task as measured by both speed and accuracy constituted the primary dependent variable.

Participants then were asked to complete another series of questionnaires in order to assess possible moderating variables. Firstly, a six-item measure adopted from Cassidy and Lynn’s (1989) Pursuit of Excellence Inventory was used to assess possible differences in participants’ achievement motivation. Example items included: “I hate to see bad workmanship” and “I find satisfaction in working as well as I can.” This variable
was measured to control for the possibility that performance on the mental rotation task may have been partially driven by intrinsic achievement motivation.

We also included a measure designed to assess mood stability and dispositional happiness. We used an investigator-developed measure to assess mood stability that consisted of two questions on a 7-point Likert-type scale anchored with "Definitely Not Me" and "Definitely Me" for the statements: "It is easy for me to get into a good mood," and "My mood doesn't change much during the typical day." We also used four items derived from the Oxford Happiness Questionnaire (Hills & Argyle, 2002) to assess dispositional happiness. These items were answered using a 7-point Likert-type scale anchored with "Definitely Not Me" and "Definitely Me" for statements like: "I often experience joy and elation" and "I laugh a lot." These variables were measured primarily to serve as potential control variables.

Once participants had completed these questionnaires at the end of the second session, they were fully debriefed. The experimenter then thanked them for their participation in the study and answered any questions.

Results

Preliminary Analyses

All statistical analyses were conducted using SPSS 16.0.1. Before performing primary analyses, an outlier analysis was performed using box-and-whisker plots. Four individuals scored exceedingly low in terms of number correct on the mental rotation task, exceeding the default 1.5-times-interquartile-distance criterion for an outlier used by SPSS, and thus they were excluded from the analysis. One participant also experienced
computer problems while completing the mental rotation task. Because this subjects’ primary outcome data were lost, the subject was excluded from all analyses.

Manipulation Checks

After watching the video to induce either a positive or neutral affective state, participants completed a video-rating questionnaire designed to gauge whether the video had the desired effect. Questionnaire item responses were averaged into a single measure in order to assess participants’ affective state after watching the video clip (Cronbach’s alpha = .951). This score was subjected to a two (positive or neutral affect) x two (goal or no goal) between-subjects ANOVA. There was only a significant main effect for affect condition, $F(1, 77) = 601.80, p = .000$, partial $\eta^2 = .887$, such that those who watched the baby video were indeed in a significantly more positive mood than those participants who watched the instructional video. For a graph of the results, refer to Figure 1; means and standard deviations for both groups can also be seen in Table 1.

Next, a second analysis was conducted to determine if the explicit goal adoption manipulation had the intended effect. Three questions, discussed earlier, were used to assess participants’ goal commitment and administered directly before the mental rotation task, with the assumption being that those who explicitly adopted the goal would report greater commitment. These questions were averaged into a single item in order to compute a goal commitment score (Cronbach’s alpha = .820). This score was subjected to a two (positive or neutral affect) x two (goal or no goal) between-subjects ANOVA. Oddly, the analysis revealed only a significant main effect for affect condition, $F(1, 75) = 8.668, p = .004$, $\eta^2 = .104$, and no main effect for the goal manipulation. Specifically,
participants who experienced the neutral mood induction at time one were significantly more likely to express goal commitment at time two than participants who underwent the positive affect manipulation. For a graph of the results, refer to Figure 2, and for means and standard deviations, refer to Table 2. Possible explanations for this unexpected finding will be discussed later, although it is important to note that participants' expression of goal commitment was not significantly correlated with performance on the mental rotation task, \( r (79) = .164, p = .147 \).

Finally, an analysis was conducted to determine participants' mood state before performing the mental rotation task itself. Because part of the purpose of the current study was to rule out an alternative explanation for Wainwright's (2011) findings, it was important to show that participants were all in a neutral mood when engaging in the rotation task. Before beginning the mental rotation task, participants were asked to complete the Brief Mood Introspection Scale (Mayer & Gaschke, 1988), which consists of sixteen items. The BMIS provides two ways to assess positive affect: a compilation of all sixteen items (eight reverse scored) into a single positive affective score (Cronbach's alpha = .771), as well as a compilation of two items intended to directly measure an individual's "happy state" (Cronbach's alpha = .709). Both of these measures were used to assess positive affectivity before each participant's performance.

These two variables were both subjected to a two (positive or neutral affect) x two (goal or no goal) between-subjects ANOVA. There was no main effect for affect condition on either the positive affective scale, \( F (1, 75) = .669, p = .416, \eta^2 = .009 \), nor the two-item happy scale, \( F (1, 75) = .1099, p = .298, \eta^2 = .014 \). This suggests that there were no significant differences between conditions as a function of mood before task
performance. For graphs of the positive affect measure and the happy measure, refer to Figures 3 and 4, respectively, and for means and standard deviations, refer to Tables 3 and 4, respectively. Mood during the mental rotation task was also not significantly correlated with performance. Neither scores on the positive affective measure, $r (79) = .102, p = .372$, nor scores on the happy measure, $r (79) = .077, p = .502$ yielded a significant correlation with performance on the mental rotation task.

Primary Analysis

Number correct on the mental rotation task was subjected to a two (positive or neutral affect) X two (goal or no goal) between subjects ANOVA. As predicted, the analysis revealed no significant main effects, but a marginally significant Affect x Goal interaction effect, $F (1, 75), p = .078, \eta^2 = .041$. Specifically, for participants in the “goal” condition, those who experienced the positive mood induction performed marginally significantly better than those who experienced the neutral mood induction, as predicted, $t (33) = 1.703, p = .098$. However, as can be seen in Figure 5, participants in the “no goal” conditions performed as well as those in the “goal and positive affect” condition. Those in the “no goal, positive affect” condition were not significantly different than those in the “goal, positive affect” condition, $t (41) = .563, p = .576$. The two “no goal” conditions also did not differ significantly from each other, $t (42) = -.664, p = .511$. Means and standard deviations for these results are provided in Table 5. These results provided partial support for the original hypothesis: when explicitly adopting a goal, experiencing positive affect (as opposed to a neutral mood) does seem to facilitate later performance.
A parallel set of findings occurred when examining whether mood at time one predicted mental rotation task performance at time two. Overall, mood after video induction at time one was not significantly correlated with mental rotation task performance at time two, \( r(79) = .044, p = .698 \). However, the correlation became (arguably) marginally significant when looking at those only in the "goal" conditions, \( r(35) = .278, p = .106 \), but remained non-significant for those in the "no goal" conditions, \( r(43) = -.159, p = .302 \).

Total time spent on the mental rotation task was also subjected to a two-way, between subjects ANOVA. There were no significant main effects, and no significant interaction, \( F(1, 75) = .945, p = .334 \). So although performance in terms of accuracy was influenced by the experimental manipulations, overall speed of performance did not seem to be affected. For a graph of these results, refer to Figure 6, and for means and standard deviations, refer to Table 6.

Exploratory Analysis

One possible alternative explanation of these findings is that arousal level was responsible for these results. In other words, because positive affect and arousal are often correlated, it is possible that the baby video may have been more stimulating than the instructional video, and therefore participants who adopted the goal after watching babies may have performed better not because of the positive nature of the video, but because of increased physiological arousal. At time one, arousal was unfortunately not assessed, and therefore its effects on performance cannot be evaluated. However, at time two, arousal could be assessed using the arousal scoring from the BMIS to compile a single arousal
score (Cronbach’s alpha = .550). When this score was subjected to a two (positive or neutral affect) x two (goal or no goal) between subjects ANOVA, there were no significant main effects, and the interaction effect was also non-significant, $F(1, 76) = .834, p = .364$. Moreover, arousal score was also not significantly correlated with performance on the mental rotation task, $r(79) = -.089, p = .438$. This suggests that arousal played a minimal role in the observed effects, at least during task performance.

To control for other potentially confounding variables, the effects of dispositional happiness, mood stability, and achievement motivation were included as covariates in a series of ANCOVAs. (Although random assignment should have controlled for these trait-like variables, they were assessed and investigated because they could have theoretically affected performance if random assignment had failed). To investigate dispositional happiness, the four items derived from the Oxford Happiness Questionnaire (Hills & Argyle, 2002) were averaged into a single dispositional happiness score (Cronbach’s alpha = .674). The Goal x Affect interaction effect remained marginally significant when controlling for dispositional happiness, $F(1, 74) = 2.806, p = .098, \eta^2 = .039$. I also averaged the two mood stability items into a single score, (Cronbach’s alpha = .358). The interaction effect was no longer marginally significant, $F(1, 74) = 2.103, p = .151, \eta^2 = .028$. However, because of the low reliability of the measure, these results should be interpreted with caution. Lastly, I averaged the six item achievement measure derived from Cassidy and Lynn’s (1989) Pursuit of Excellence Inventory into a single achievement score (Cronbach’s alpha = .696). The Goal x Affect interaction effect again remained marginally significant when controlling for achievement motivation, $F(1, 74) = 4.258, p = .043, \eta^2 = .054$. These analyses suggest that dispositional happiness, mood
stability and achievement motivation probably had minimal or no impact on the pattern of results.

Discussion

As predicted, positive affect at the time of explicit goal adoption facilitated later performance compared to those who explicitly adopted the goal in a neutral mood. Moreover, this effect was strong enough to withstand an entire week’s delay between the time of goal adoption and goal pursuit. This suggests that when positive affect is experienced during goal adoption, it may indeed provide long-term benefits for goal pursuit. In addition, participants’ mood just prior to completing the mental rotation task did not vary by condition and was not significantly correlated with performance. This effectively rules out the traditional ‘energizing effect’ as an explanation for these results because participants were not in a more positive mood when actually completing the task itself. It is also unlikely that these results occurred because of context-dependent effects because participants completed session one and session two in different rooms. Finally, controlling for several possible confounds also failed to change the observed interaction, suggesting the observed effects are relatively robust.

However, unexpectedly, those in the “goal and positive affect” condition did not outperform those in either of the “no goal” conditions. Indeed, those who did not explicitly adopt a goal – regardless of which video manipulation they received – performed on par with those in the “goal and positive affect” condition. This may reflect something unique about explicit goal adoption, and does provide some support for the idea that positive affect may have distinctive effects in that context. More specifically,
the results suggest that rather than enhancing performance, positive affect served as a buffer against some negative effect associated with explicit goal adoption.

Manipulation checks also revealed that the method of encouraging participants to explicitly adopt the goal of doing well may not have been as effective as anticipated. Specifically, those assigned to the explicit goal conditions did not report being more motivated. Oddly, only those who received the neutral affect manipulation were more likely to later express goal commitment, with those in the positive affect conditions expressing less commitment. This may be related to goal adoption generally, or to the specific method of goal adoption used in this study. It is possible that encouraging participants to “represent Butler well” placed pressure on participants, causing anxiety that hindered performance. However, using commitment as a covariate in an ANCOVA had minimal impact on the interaction, \( F(1, 74), p = .071, \eta^2 = .043 \). This tentatively suggests that the mechanism responsible for the high performance of the neutral mood conditions may be different than the one responsible for the similarly high level of performance in the “goal, positive affect” condition.

Overall, this study does provide further evidence for the importance of one’s affective state during goal adoption. It also extends previous work, demonstrating that the impact of positive affect during goal adoption is not just confined to the short-term (Wainwright, 2011), but can stretch over the long-term as well. It also provides more conclusive evidence that positive affect is important at goal adoption specifically by eliminating the alternative explanation that plagued Wainwright’s (2011) findings. In the current study, mood did not vary across conditions at the time of the task and mood during goal pursuit itself was not significantly correlated with performance. These
findings suggest the ‘mood as energizer’ interpretation cannot explain the observed effects. However, more work is still needed in order to fully examine the relationship between positive affect and goal adoption.

Firstly, future research should further investigate why this effect occurs. The current work presumes a cognitive explanation for these results, in which the “goal concept” becomes more accessible because of how it comes to be represented in memory. Indeed, the results of this study are highly consistent with this idea. Rather than directly enhancing performance, positive affect seemed to provide a buffer against some negative effect associated with explicit goal adoption (e.g., fear of letting down Butler). This would be consistent with the idea that the goal concept, when formed in memory, became linked to other positively-valenced nodes in the cognitive network and was in turn prevented from being associated with negatively-valenced concepts. Participants in the “goal, neutral affect” condition, on the other hand, may have ended up with a goal that was linked to at least some negative, performance impeding concepts. When the goal was then activated, so then were doubts and misgivings associated with the goal, which decreased task performance. However, this study was not designed to specifically test this hypothesis and future research should investigate this explanation more closely. For example, if the goal concept is truly linked to other positively-valenced nodes in the cognitive network, then this should be revealed in a semantic priming task, in which one should be faster to respond to a positive (vs. a negative or neutral) word when primed with a goal-related (vs. non-goal-related) concept.

Secondly, future research would also do well to explore different methods of goal adoption, as it remains unclear whether these results are due to the specific method of
POSITIVE AFFECT AND GOAL ADOPTION

goal adoption used in this study or to goal adoption more generally. For example, goal contagion – where one person adopts a goal simply from watching another perform a goal-oriented task (Aarts, Gollwitzer, & Hassin, 2004) – might be one effective method of goal adoption that would not necessarily cause subjects to experience the same pressure associated with asking participants to “represent Butler well,” and would also increase the generalizability of these findings.

Lastly, future research should investigate the effect of positive affect on different types of goals. Performance on the mental rotation task is a discrete task that occurs at one point in time. Since positive affect does seem to promote performance over the long-term, it would be interesting to see if positive affect also promotes performance on long-term goals, such as the goal to go to the gym once a week. This could potentially have important implications for many types of routine goals, and it could specifically provide help for those pursuing health-related goals during a time when our nation faces ever-increasing rates of obesity and other health-related issues.

Conclusion

The current study builds on previous work by confirming that positive affect does appear to play an important role during goal adoption. Additional research is needed to explore this relationship further and determine to what extent it generalizes to other goals.

Overall, however, these results do suggest that positive affect experienced at goal adoption does have a facilitative, long-term effect on later performance.
References


Isen, A. M., & Reeve, J. (2005). The influence positive affect on intrinsic and extrinsic motivation: Facilitating enjoyment of play, responsible work behavior, and self-


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social psychology, 45(3), 513.


Emotion, 8(2), 208-215.

Table 1

*Mood After Video*

<table>
<thead>
<tr>
<th>Affect Condition</th>
<th>Goal</th>
<th></th>
<th>No Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>Positive</td>
<td>19</td>
<td>6.06</td>
<td>.55</td>
</tr>
<tr>
<td>Neutral</td>
<td>18</td>
<td>2.47</td>
<td>.85</td>
</tr>
</tbody>
</table>

*Note: Positive affectivity measured on 1-7 scale, 7 being the most positive affective state*
Table 2

*Goal Commitment Before Task*

<table>
<thead>
<tr>
<th>Affect Condition</th>
<th>Goal</th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>n</em></td>
<td><em>M</em></td>
<td><em>SD</em></td>
<td></td>
<td><em>n</em></td>
<td><em>M</em></td>
</tr>
<tr>
<td>Positive</td>
<td>19</td>
<td>4.72</td>
<td>.88</td>
<td>25</td>
<td>4.60</td>
<td>1.09</td>
</tr>
<tr>
<td>Neutral</td>
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<td>5.37</td>
<td>1.10</td>
<td>19</td>
<td>5.25</td>
<td>.85</td>
</tr>
</tbody>
</table>

*Note:* Goal commitment measured on 1-7 scale, 7 being the most commitment.
Table 3

BMIS Positive Scale Before Task

<table>
<thead>
<tr>
<th>Affect Condition</th>
<th>Goal</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>$M$</td>
</tr>
<tr>
<td>Positive</td>
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<td>2.68</td>
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<tr>
<td>Neutral</td>
<td>18</td>
<td>2.78</td>
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</table>

*Note:* Positive affectivity measured on 1-5 scale, 5 being the most positive affective state.
Table 4

BMIS Happy Scale Before Task

<table>
<thead>
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<th>Affect Condition</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>$M$</td>
</tr>
<tr>
<td>Positive</td>
<td>20</td>
<td>2.68</td>
</tr>
<tr>
<td>Neutral</td>
<td>18</td>
<td>2.81</td>
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</table>

*Note:* Positive affectivity measured on 1-5 scale, 5 being the most positive affective state.
Table 5

*Mental Rotation Task Performance*

<table>
<thead>
<tr>
<th>Affect Condition</th>
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<th>No Goal</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
</tr>
<tr>
<td>Positive</td>
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<td>3.29</td>
<td>25</td>
</tr>
<tr>
<td>Neutral</td>
<td>17</td>
<td>25.65</td>
<td>3.72</td>
<td>19</td>
</tr>
</tbody>
</table>
Table 6

Total Time on Mental Rotation

<table>
<thead>
<tr>
<th>Affect Condition</th>
<th>Goal</th>
<th></th>
<th></th>
<th>No Goal</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Positive</td>
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<td>132960.89</td>
<td>58759.41</td>
<td>25</td>
<td>112706.12</td>
<td>54275.56</td>
</tr>
<tr>
<td>Neutral</td>
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<td>114000.24</td>
<td>52245.86</td>
<td>19</td>
<td>118659.68</td>
<td>60045.51</td>
</tr>
</tbody>
</table>

*Note:* Time measured in milliseconds.
Affect After Video Induction

Figure 1. Participants who watched the baby video were in a significantly more positive mood state than participants who watched the instructional video. Affect was measured on a 1-7 scale, with 7 being the most positive affective state.
Figure 2. Participants who watched the instructional video one week prior were significantly more likely to express goal commitment than participants who watched the baby video. Goal commitment is measured on a 1-7 scale, with 7 indicating the most commitment.
Figure 3. There were no significant differences in mood between conditions before the start of the mental rotation task. Positive affect score is derived from the Brief Mood Induction Scale and measured on a scale of 1-5, with 5 indicating the most positive affect.
Figure 4. There were no significant differences in mood between conditions before the start of the mental rotation task. Happy score is derived from the Brief Mood Induction Scale and measured a scale of 1-5, with 5 expressing the most positive affect.
Figure 5. Participants who adopted the goal and experienced the positive mood induction performed marginally significantly better than participants who adopted the goal and experienced the neutral mood induction. Participants who did not adopt the goal performed on par with those who explicitly adopted the goal and experienced the positive mood induction. Performance is measured by number correct out of 30.
Figure 6. There were no significant main or interaction effects for time spent on the mental rotation task.