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On the cued activation of situational motivation☆

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Abstract

We examined the hypothesis that situational (or state) motivation can generalize from one situation to another via activation by associated cues. In an experimental setting, a neutral cue (a computer tone sequence) was paired repeatedly with controlling feedback. We then assessed the effect of presenting this conditioned cue during a subsequent task on participants' motivation for that novel task. In two studies we found evidence that cued activation of controlledness significantly undermined participants' self-determined motivation toward this subsequent task. These findings demonstrate that subtle cues, including contextual primes, can influence people's motivational state.

Keywords: Intrinsic and extrinsic motivation; Cued activation; Controlling feedback

What determines a person's motivational state when engaging in a novel activity? In general, motivation toward various activities is strongly influenced by people's perceptions of autonomy with respect to those activities. According to Self-Determination Theory (Deci & Ryan, 1985, 1991, 2000), humans have a fundamental need to feel *autonomous*, to feel that they are freely choosing their own actions. When this need is satisfied, people feel autonomous and this enhances their self-determined motivation toward a new activity (i.e., I play piano because I choose to; Sheldon, Elliot, Kim, & Kasser, 2001). Self-determined motivation is thus observed when an individual performs a behavior or activity out of personal choice, satisfaction, or pleasure. On the other hand, non-self-determined motivation implies engaging in an activity or behavior for *controlled* reasons (i.e., I play piano because my teacher forces me to). Non-self-determined motivation can be observed when one performs a behavior in order to attain a positive end state (e.g., obtaining a reward) or to avoid a negative end state (e.g., avoiding a punishment). It can be triggered by feelings of being controlled and a likely outcome of such a motivational tendency is the cessation of the behavior once rewards or punishments are removed (Deci, Koestner, & Ryan, 1999).

When people engage in a new activity, their motivational state can be influenced by a range of factors. In the present study, we examined the cued activation of contextual motivation. According to the Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM; Vallerand, 1997; Vallerand & Ratelle, 2002), motivation exists at three levels of generality. At the most global level, individuals tend to have a dispositional motivational orientation. At the most specific level, they adopt a particular motivational state in particular situations. In between these levels, studies have shown that

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individuals tend to adopt a similar orientation toward activities within the same context or life domain (e.g., education, leisure, work, interpersonal relationships, etc.; for a review, see Vallerand). For example, a person might display self-determined forms of motivation toward most leisure activities and interpersonal relationships but non self-determined forms of motivation toward educational activities.

One of the postulates of the theory is that motivation generalizes across activities within a life domain because of contextual cues that activate the motivational orientation associated with that context in memory. For example, a student who has felt controlled by a domineering piano teacher might come to associate a lack of autonomy with cues such as metronomes, hard benches, repetitive drills, and other aspects of the context. Upon encountering a new and potentially enjoyable activity of a similar kind, if any of these cues is present, it can activate the non-self-determined motivational orientation that has generalized to this context, which in turn would lead to a non-self-determined situational motivation toward the new activity in that particular situation.

To test this principle, we drew on recent research examining cued activation. In several recent studies, classical conditioning procedures have been employed to associate an initially neutral cue (e.g., a computer tone) with various interpersonal states such as being criticized or being accepted (Baldwin, Granzberg, Pippus, & Pritchard, 2003; Baldwin & Main, 2001; Baldwin & Meunier, 1999). This research has shown that when the conditioned tone is re-played later, it tends to re-create the subjective state of feeling criticized or accepted.

In the present series of studies, our goal was rather to use classical conditioning techniques to associate a cue with the state of feeling controlled, to test whether presenting this conditioned cue during another related task would activate this motivational state. Several studies have shown that feelings of controlledness can significantly undermine self-determined motivation and the tendency to engage in a task during a free-choice period (for a review, see Vallerand, 1997). We sought to extend these findings in two ways by showing that such undermining effects can take place out of a person's awareness with the mere presentation of a situational cue and that they can also be transferred to a related but new activity.

Study 1

Method

Participants

Female undergraduate participants ($n = 24$; mean age 20 years, range = 18–30 years) volunteered and were paid 7 dollars for their participation.

Procedure

Participants were seated at a computer. They first read 20 screens of brief instructions and informed consent information, with each screen preceded by a particular 1-s tone sequence. This *neutral tone* was presented in this manner so that participants would become familiar with it, but it would not be associated with any particularly impactful stimuli.

Participants then performed a task identified as "Find the Error," in which they were to find an inconsistency between two nearly identical cartoons. A series of 20 pairs were presented. After each trial, a second tone sequence was presented (the *conditioned tone*), followed by instructions designed to induce feelings of controlledness in all participants. This feedback read: "You did the puzzle as you should have, now you have to continue with the next one, as is expected of you." Research has shown that this type of feedback is perceived as controlling and induces losses of intrinsic motivation (see Ryan, 1982). By the end of this task, all participants had therefore received 20 pairings of the conditioned tone with the controlling feedback (note that the particular sequence was counterbalanced with the neutral tone across subjects such that each tone was interchangeably used as either a neutral or a conditioned tone).

Following a 10-min filler task involving a paper and pencil word search about whales, participants were introduced to the novel computer activity. This involved looking at drawings in which the word "NINA" was hidden one or more times, to find at least one of the NINAs (Hirschfeld, 1998). This task has previously been used in the motivational literature (e.g., Elliot & Harackiewicz, 1996; Harackiewicz & Larson, 1986), and participants tend to find it challenging and enjoyable. There were 20 puzzles in total and a tone was presented as the computer progressed from one trial to the next. The experimental manipulation involved giving half the participants repeated exposures of the conditioned tone, to recreate the state of feeling controlled, while giving the other half repeated exposures of the neutral tone. Assignment to condition was done randomly by the computer.

Following the NINA task, participants were given a questionnaire that included measures of affect (see below). Afterwards, a behavioral measure of situational motivation was obtained. The experimenter told participants that she had forgotten to make copies of the last questionnaire and left the room to make photocopies. Participants were left alone for a period of 8 min and were told that they could do NINA puzzles if they wanted to or read some magazines. The behavioral indicator of motivation was simply whether they returned to the NINA task during the free choice period.

Measures

Affect. We administered the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen,

1988) to measure mood state immediately after completing the NINA puzzles. Participants rated, on a 5-point scale ranging from 1 (not at all) to 5 (extremely), the extent to which each of the 20 emotions corresponded to the way they were feeling. Examples of items include "interested" and "excited" for the positive affect subscale, and "distressed" and "upset" for the negative affect subscale. Previous research has supported the psychometric qualities of the PANAS and, in the present study, both subscales were found to be highly reliable (positive affect, $\alpha = .91$; negative affect, $\alpha = .90$).

Results and discussion

First, we assessed whether our experimental manipulation induced different affective states in experimental and control groups. We did not find any significant effects on positive or negative affect (t's < 1.4) as a function of experimental condition. Thus, as expected, there was no evidence that the treatments had a general impact on mood.

We then performed a logistic regression[1] to predict participants' behavior (i.e., whether they engaged in this activity during the free-choice period or not) as a function of which tone was being played (neutral or conditioned-controlling). We found a significant effect for our experimental manipulation such that participants who received the conditioned-tone were less likely than their control-group counterparts to return to the NINA puzzles during the free choice period (Wald's $z = 2.62$, $df = 1$, $p_{1\text{-tail}} = .05$, odd ratio $= 4.20$). Hence, hearing the tone previously associated with controlledness made people less likely to return to the task during a free play period. In terms of frequencies, only 25% (3 out of 12) of the participants in the cued activation condition chose to complete NINA puzzles, compared with 58% (7 out of 12) in the control condition. In terms of the number of puzzles solved, individuals in the cued activation condition did half as many puzzles on average ($M = 8.58$, $SD = 15.62$) as individuals in the control condition ($M = 17.17$, $SD = 18.76$).

In summary, the results of this study demonstrate that simply being presented with a tone previously associated with controlling feedback undermined individuals' tendency to go back to the activity during a free-choice period. This effect does not appear attributable merely to changes in mood since experimental and neutral groups reported similar levels of positive and negative affect.

[1] We considered analyzing the number of NINA puzzles each participant solved. However, because many participants did not return to the NINA task during the free-choice period, there was a non-normal, bimodal distribution in the number of tasks completed (i.e., many participants completed zero). For this reason, logistic regression was judged the appropriate analysis.

Study 2

We conducted a second study with a number of goals in mind. First, we wished to replicate the findings with the addition of male participants. Second, we sought to assess the effects of cued activation with a self-report measure of subjective motivation, namely the Situational Motivation Scale (Guay, Vallerand, & Blanchard, 2000). Finally, we wanted to test that the effects of cued activation we observed were indeed due to the controlling nature of the feedback given. We added a condition in which the cue was associated with autonomy-supportive, rather than controlling, feedback. Previous research (e.g., Zuckerman, Porac, Lathin, Smith, & Deci, 1978) has shown that autonomy-supportive feedback, which gives participants the sense of being free to choose the type of activity to engage in, tends to promote or preserve rather than undermine self-determined motivation. Therefore, by including a condition in which a cue was paired with this type of feedback, we can rule out the possibility that any conditioned cue, no matter what it was paired with, might have a detrimental effect on situational motivation. If we were to obtain an undermining effect for cued controlledness but not for cued autonomy support, then we would be able to conclude that the undermining of self-determined motivation resulted from the activation of a controlled state via a conditioned cue.

Method

Participants

Undergraduate participants ($n = 76$; 30 females, 46 males; mean age $= 19$ years; range $= 17$–26 years) volunteered for course credit or 7 dollars.

Procedure

The procedure was similar to the first study, with slight modifications. During the "Find the Error" conditioning task, half the subjects received the controlling feedback as before. The remaining participants received autonomy-supportive feedback. Based on work by Zuckerman et al. (1978), we designed our autonomy-supportive instructions to give participants an opportunity to make a choice for each puzzle. We told them that puzzles were classified in two categories (comical and puzzling) and they could choose whichever they wanted for the next puzzle by pressing the appropriate key. (This choice was in fact bogus because all the cartoons were both comical and puzzling, and all participants received the same puzzles.) We also suggested that they could choose different cognitive strategies to localize the error, such as looking at the big picture or narrowing down to details. We anticipated that this type of feedback would not undermine motivation toward a new task in the same way that controlling feedback would.

Following the NINA task, participants were given a questionnaire that included measures of situational motivation and affect. Following these measures, a manipulation check for the adequacy of our controlling feedback was administered in which participants were asked questions about their feelings of being controlled during the initial "Find the Error" task. Finally, the free-choice behavioral measure of situational motivation was obtained.

Measures

We assessed affect with the PANAS as in Study 1. We assessed subjective motivation via the Situational Motivation Scale (SIMS; Guay et al., 2000). The SIMS asks participants to indicate the extent to which a range of items correspond to their reasons for doing a specific activity. Subscales assess external regulation, intrinsic motivation, identified motivation, and amotivation. Example of items include: "Because I think that this activity is interesting" (intrinsic motivation, 4 items; $\alpha = .89$), "Because I am doing it for my own good" (identified regulation, 4 items; $\alpha = .69$), "Because I don't have any choice" (external regulation, 4 items; $\alpha = .90$), and "I don't know; I don't see what this activity brings me" (amotivation, 4 items; $\alpha = .70$). Past research has shown that the SIMS is a valid and reliable instrument. Participants indicated, on a 7-point scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly), the extent to which each item corresponded to their reasons for doing the NINA puzzles.

The manipulation check of perceived controlledness, which assessed participants' feelings during the initial "Find the Error" puzzles when they were receiving controlling or autonomy-supportive feedback, was created for this study by reversing items previously used (by Sheldon et al., 2001) to measure autonomy. Items (4 in total; "I felt free to do what I wanted," "I behaved out of personal choice, not obligation," "I felt freedom to act," and "I felt freedom to make my own decisions") were answered on a 7-point scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). An α of .87 was obtained for this sample.

Design

A 2 (controlling vs. autonomy-supportive feedback) × 2 (conditioned vs. neutral tone) × 2 (gender) design was used.

Results and discussion

Preliminary analyses of the manipulation check revealed that individuals receiving the controlling feedback during the initial "Find the Error" task reported feeling more controlled ($M = 4.28$) during that task than individuals receiving the autonomy-supportive feedback ($M = 3.43$; $F(1,72) = 7.57$, $p = .007$). There were no effects involving gender or cue variables (Wilks' $\Lambda = .86$, $df = 10.65$, $p > .05$). This finding demonstrates that the manipulation of feedback was effective. As in Study 1, there were no condition differences on positive or negative affect.

We then followed with an analysis of the motivational profiles for each experimental group, using self-reported (i.e., the SIMS) and behavioral measures of motivation. With respect to the SIMS, the only significant effects involved the external regulation subscale, on which there was a main effect of conditioning ($F(1,72) = 8.85$, $p = .004$) that was qualified by the predicted two-way interaction between conditioning and feedback ($F(1,72) = 6.38$, $p = .014$). Consistent with our hypothesis, when doing a new task (the NINA puzzles), being presented with a tone that has been paired with controlling feedback led to increases in external regulation ($M = 3.03$), in comparison to the neutral tone ($M = 1.55$) and to presentation of a tone associated with autonomy support ($M = 2.14$). Both tests were found to be significant (for neutral, $t(72) = 3.91$, $p < .001$; for autonomy support, $t(72) = 2.35$, $p < .05$). Thus, cued activation of a controlling state during the NINA puzzles led to higher levels of external regulation than presentation of a neutral tone or presentation of a tone associated with autonomy-supportive feedback. On the self-report measure of motivation, then, the cued activation of controlledness produced heightened levels of external regulation. There were no effects involving gender.

Next, we examined the effects of our manipulations on the behavioral measure of motivation. As in Study 1, a logistic regression was performed to predict whether participants performed Nina puzzles during the free play period. This analysis did not yield any significant effects. We were puzzled by this lack of findings, particularly given the self-report effects. On the strength of the findings obtained in Study 1, we conducted an internal analysis (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990) to determine if the behavioral effect among women was replicated. In a logistic regression conducted with women, the expected Condition × Feedback interaction effect was significant (Wald's $z = 2.65$, $df = 1$, $p_{1\text{-tail}} = .05$, odd ratio = 16.0). The main difference was, as expected and consistent with Study 1, in the controlling feedback conditions when comparing the conditioned-tone group (only 50%, or 5 out of 10, chose to complete NINA puzzles) with the neutral-tone group (86%, or 6 out of 7, chose to complete NINA puzzles; in the autonomy support conditions the frequencies were fairly similar, at 4/6 and 3/7, respectively). In terms of number of puzzles solved, in the controlling feedback conditions, the conditioned-tone group solved 14.8 puzzles on average, compared with 21.6 in the neutral-tone condition (in the autonomy support conditions the means were similar, with 18.5 and 19.9, respectively). Parallel analyses

for men did not yield any significant effect, nor, as already mentioned, did we obtain a significant interaction with gender. The lack of a behavioral effect for men is thus unclear. When we examined correlations between the behavioral indicator and the self-report of external regulation, however, we found that while women showed a weak negative correlation ($r = -.13$) between feeling externally regulated and choosing to return to the NINA puzzles during the free play period, as would be expected, men showed a significantly different—and significantly positive—correlation ($r = .35$, $z = 2{,}07$, $p = .04$). Men were more likely, rather than less likely, to return to the NINA task to the extent that they felt externally regulated, which could account for the inconsistent findings on the behavioral measure even though the self-report showed clear effects of the conditioned cue. We return to this point shortly.

Conclusions

The goal of this research was to examine whether cued activation might cause a motivational state to be generalized from the situation in which it was learned to a novel task. Results of two studies, using classical conditioning, provided supportive evidence. In the first study, the cued activation of controlled feelings undermined participants' tendency to go back to the task during a free-choice period, in comparison to presentation of a neutral tone. In the second study the impact of the cue was clearly evident on participants' self-reported motivation toward the novel task, and behavioral effects were observed among female subjects. Participants hearing the tone previously associated with controlling feedback felt extrinsically motivated while engaged in what, to other participants, were objectively rather enjoyable puzzles. In neither study were there any significant effects on self-reports of generalized positive and negative affect, indicating that the effect of the cues was limited to motivational states having to do with the task in question.

To our knowledge, these studies are the first to demonstrate the cued activation of a motivational state. The findings provide support for the *top-down specificity hypothesis* proposed by Vallerand (1997) and Vallerand et al. (2004). According to Vallerand et al., contextual motivation can influence situational motivation toward an activity related to the context at hand. They proposed that contextual motivation is stored in memory along with related cues such that presentation of a situational cue can activate contextual motivation, which will determine situational motivation. Here, we have shown that presenting a cue linked to an experimentally created context could activate the motivational orientation associated with it, which then leads to specific top-down effects on situational motivation.

The results underscore the subtlety of factors that determine individuals' motivation toward a novel task. Until now, most research on motivational determinants has examined the impact of different kinds of interpersonal feedback and overt instructional sets on the individual's response to the specific activity being discussed (see Deci & Ryan, 2000; Vallerand, 1997 for reviews). In recent social cognitive research by Lévesque and Pelletier (2003), motivational states were activated via a priming procedure involving words related to extrinsic motivation (e.g., competitive, obligation) or intrinsic motivation (e.g., spontaneous, interested). Their findings revealed that persistence on the subsequent puzzles was higher when an intrinsically motivated state was activated, compared to neutral primes and extrinsic motivation. Our findings take the phenomenon a significant step further, showing that even minimal cues can activate a motivational state if they have been associated in the past with controlling feedback. Further, what we manipulated were not cues of intrinsic or extrinsic motivation (as in the Levesque and Pelletier study) but rather the very mechanism that has been hypothesized by Self-Determination Theory (SDT; Deci & Ryan, 2000) to produce the motivational change from intrinsic to extrinsic motivation, namely feeling controlled. Thus, these findings indicate that the impact of factors that are overt in one situation can be generalized across situations through incidental associations. More importantly, the present results underscore the fact that the mediating mechanism proposed by SDT also takes place out of awareness.

One caveat involves some inconsistency between the two motivation measures in Study 2, with the behavioral effect being limited to female participants. Moreover, there was a significant difference in that study between men and women in the correlation between self-report and behavior. As all the participants in Study 1 were women, this suggests that there may be a gender difference in the cued activation effect, at least in terms of behavioral indicators. Given the lack of significant higher-order interactions involving gender, we are reluctant to draw firm conclusions until this apparent difference can be systematically examined with larger samples and potential mediating variables can be assessed. Gender differences are not commonplace in this literature (see, e.g., Deci et al., 1999), although some previous studies using this type of behavioral indicator (e.g., Koestner, Zuckerman, & Koestner, 1987) have indicated that women may be more prone than men to showing motivation decrements due to controlling stimuli, and that behavioral and self-report indicators are not always consistent (see also Deci & Ryan, 1985; Henderlong & Lepper, 2002). We note that the fact that the cues were found to influence both self-report and behavioral (for women) indicators of motivation suggests that the cued activation of situa-

tional motivation has an impact at both explicit and implicit levels. Future research could therefore examine moderating factors, such as gender, that might uncover specific motivational dynamics occurring in different situations and with different indicators of motivation. Perhaps, for example, men tend to respond to the cued activation of feelings of external regulation by trying to maximize achievement, while women withdraw their involvement from the task (see also Baldwin et al., 2003; Koestner et al., 1987).

In conclusion, the present research demonstrates one process through which the motivation developed toward an activity transfers to a new activity, namely cued activation. Our findings support the proposition from the Hierarchical Model to the effect that environmental cues are stored in memory with contextual motivation such that these cues can activate this contextual motivation, which will then predict situational motivation toward the new activity.

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