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Does affect regulation take precedence over impulse control?

Conference Talk 23.09.03

Fachgruppe Sozialpsychologie

DGFP

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Summary

Investigated findings reported by Tice, Bratslavsky, and Baumeister (2001) suggesting that the breakdown of impulse control serves the regulation of negative mood. Tice et al. suggested that impulsive behavior, like e.g. uncontrolled eating or procrastination, serves the function of regulating negative mood. This is expected to happen only in a situation where people expect to be able to influence their mood, whereas in case of a „mood-freeze“ – instruction, where subjects are made believe that their mood is stable and not susceptible for change, impulsive behavior would not occur. This point is referred to as the „mood regulation hypothesis“. In the present study, it is argued that in contrast to the mood regulation hypothesis, impulse control may fail as well under conditions, where besides mood regulation a need for additional stimulation arises, e.g. in case of a boring task condition. This point is referred to as the „arousal hypothesis“. It is demonstrated, that impulsive eating increases if subjects are brought in a boring situation as compared to an interesting task. This effect is independent of mood, since across all experimental conditions, a mood-freeze instruction was given. The findings cannot be accounted for by mood regulation, but are in line with the arousal hypothesis. An integrative approach is suggested, stating that mood regulation effects occur when mood is perceived as controllable whereas in case of uncontrollable mood, effects of self activation can account for impulsive behavior.

Impulse control has recently been conceptualized in terms of affect regulation. It was assumed „that impulse control may fail because emotionally distraught people give primacy to affect regulation“ (Tice, Baumeister, & Bratslavsky, 2001). The authors argue, that impulse control emerged as an adaptive strategy to resist short-term gratifications in order to being able to pursue long-term-goals. However, if one feels bad, an urge for affect regulation takes precedence over impulse control and allures the individual towards immediate gratification as provided by eating, drinking alcohol, gambling, or failing to resist sexual temptation. People seek immediate pleasure in order to reduce negative affective states. They do so, because they expect to be able to regulate their mood. Tice et al. conducted several experimental studies of their reasoning. They used a mood-freeze procedure to manipulate perceived changeability of subjects' mood. Half of the subjects in their experiments were told that their mood would not be changeable through the rest of the experimental procedure whereas the other half didn't receive such an instruction. It was assumed that subjects would implicitly believe that they could change their mood if not instructed otherwise. Secondly, mood was manipulated using scenarios depicting either a very unpleasant situation or a happy one. Using several dependent variables such as eating snacks or procrastination, Tice et al. could demonstrate that subjects in a condition of negative mood preferred immediate gratification like eating or frivolous procrastination thus giving short-term affect regulation priority over impulse control. This happened only if the subjects believed their mood to be changeable. However, the authors notice that „people engaged in various behaviors only when these behaviors held some promise of being able to improve their moods, but we found precious little evidence that moods actually improved“ (Tice et al., 2001, p.64).

To my mind, although these findings seem convincing at face value, there are some questions still worth further consideration: firstly, the authors assume a single motive (affect regulation) accounting for failure of impulse control. Other accounts, like e.g. self destruction or capacity impairments are discarded. In the following, I will refer to this point as the „single motive hypothesis“. Secondly, it is admitted that the „master motive“ accounting for impulsive behavior is constantly frustrated. Although people initially believe to improve their mood, they never manage to do so. In other words, the behavioral strategy applied for affect-regulation proves to be maladaptive. As a third point, if people consider their mood as stable and unchangeable (although negative), they should display no or little signs of impulsive behavior. Considering the „single motive hypothesis“, some practical observations aroused my doubts about its applicability. We know from experience that there is such a thing as self-destructive impulsive behavior that in many cases can reach such extremes as suicide. In case of eating disorders, alcohol or drug abuse, people anticipate that after being seized with consumption of massive amounts of food, alcohol, or drugs, they will actually feel severely worse afterwards. In case of sexual escapism and adultery, people often anticipate their subsequent feelings of guilt, the aversive risk of marital breakup and the like. Nevertheless, they indulge in the immediate impulse. Considering situations such as these, it seems unrealistic to assume that mood improvement is sought in the face of considerable future distress.

Secondly, concerning the theoretical assumptions underlying the research by Tice et al., the single motive hypothesis of impulsive behavior implies that people constantly apply strategies of affect regulation that are ineffective. From an evolutionary perspective, the authors argue that strategies of gratification delay (i.e.

impulse control) are adaptive in order to achieve a long-term goal. But then, where is the adaptive function of ineffective strategies of affect-regulation?

However, the most critical point is the statement that impulsive behavior should not occur when people consider their mood as unchangeable. Let us consider the third experiment reported by Tice et al. (2001, p. 63) in the light of this assumption: in the left column of table 1, the means of the dependent variable „procrastination“ are reported. If people are in a bad mood, there is a preference for boring, unchallenging distractors as compared to positive mood. This is true for the frozen mood condition, whereas in case of changeable mood, the reverse does hold. How can this observation be explained in terms of the affect-regulation hypothesis? To my mind, not at all since in the „frozen mood“ condition, no attempts of affect regulation should appear at all, and hence no differential preferences for stimuli leveraged in mood regulation.

The findings reported by Tice et al. convincingly support the mood-regulation hypothesis if we consider the changeable mood-condition. However, I suggest that there is at least one further process responsible for the breakdown of impulse control. This process can be considered in terms of an arousal hypothesis. Following an activation theory (Parkinson, 1988), undifferentiated arousal is assumed to underlie various emotional states. According to Duffy (1962), behavior is determined by its direction and intensity. As intensity is a function of overall activation, all behavior is determined by an activation continuum ranging from a low point in sleep to a high point in extreme activation or emotion respectively. Behavioral efficiency is associated with an intermediate level of arousal: whereas low levels provide insufficient energy for optimal performance, high levels of arousal tend to result in disruption and disorganisation of behavior. Activation theory provides a very broad

concept to account for human behavior. However, it is not sufficient to explain emotion. There is a general agreement that emotion, besides its intensity, is determined by its quality as well. Pleasure and displeasure determine the quality of emotions together with activation and deactivation, as suggested by several pleasure-arousal theories of emotion (Feldman Barrett & Russell, 1998; Reisenzein, 1994). Considering activation, a broader perspective on impulsive behavior emerges. If people feel bored or realize insufficient activation, impulsive behavior like eating, drinking or smoking can occur as a means of self-stimulation, aiming at an intermediate level of arousal. As an example, consider a person having a quiet Sunday afternoon at home. This person may be in a balanced mood, neither having negative nor positive affect. On the table there is a bowl of cookies, and our person eats all of them although she didn't mean to. This little scenario is realistic, but difficult to explain in terms of the mood regulation hypothesis. The arousal hypothesis states, that impulsive behavior can be understood as a means of self-stimulation. If a situation is boring or uninspiring, people are therefore inclined to seek immediate gratification, e.g. by means of eating, in order to reach a higher level of activation. The arousal-hypothesis, i.e. the assumption that impulsive behavior may be a means of self-stimulation, can account for the mentioned-above differences in the third study by Tice et al.(2001): If people are in a positive mood, additional incitation is sought (challenging distractors), whereas in case of negative mood, it is avoided, because a high level of arousal is already reached. The mood-regulation hypothesis, to the contrary, predicts that no differences should be found in the dependent variable.

On the other hand, the mood-regulation hypothesis is supported by the findings reported for the „changeable mood“-condition. Mood regulation and self-stimulation

are not mutually exclusive as theoretical concepts to account for impulse control. Much to the contrary, both concepts imply a regulatory process aiming at an optimal level of arousal. If, in case of negative mood, this optimal level of arousal is exceeded, the necessity of downward regulation appears, whereas in case of low activation, auto-stimulative action is initiated. An important consequence of this reasoning is, that one and the same behavior can be applied for different regulatory purposes: eating or procrastination for example, may be chosen to regulate negative mood (downward regulation) or low-level activation (self-stimulative behavior, upward regulation).

As a consequence, people should have a tendency to indulge in impulsive behavior if they seek stimulation, even if they do not expect to improve their mood. An unequivocal effect of self-stimulation on impulsive behavior should be traceable precisely in a situation where mood regulation as a motive can be excluded. To test this reasoning, an experimental study was conducted which involved a mood manipulation similar to the mood induction procedure used by Tice et al. (2001). However, all subjects participating in the study were given a mood-freeze instruction to make them believe that their mood would remain constant during the experimental session. Furthermore, subjects were given either an interesting, demanding task or a very boring one. It was hypothesized, that eating as a sign of a loosening in impulse control would be at an increased level in the boring condition as compared to subjects given an interesting task. Following the arousal hypothesis, this should happen because subjects experience a heightened need for self-activation in a boring condition. The mood-regulation hypothesis, however, would predict that no differences between groups should occur because participants do not expect to influence their mood.

Method

Participants

40 subjects participated in the study of which 18 were male and 22 female. The subjects' age ranged from 19 to 43 years. 15 subjects were undergraduate students in psychology at the Universität Koblenz-Landau. Another 25 subjects were agents from a call center providing service for cable TV in Heidelberg. Undergraduate students received two hours of experimental credit, the non-student subjects participated voluntarily. One participant left the laboratory in order to have a cigarette while the experimenter was away; the data of this person therefore had to be excluded from the analysis.

Laboratory Arrangements

Besides the use of questionnaire-material, a computer was used to present a mood questionnaire at two different times in the experiment. The computer was also used to present a filler-task in one experimental condition. The material was programmed by the author using the ERTS-software.

Procedure

The participants were welcomed in the laboratory and asked to sit down at a table. A questionnaire was administered that was developed by the author and a team of students¹ to measure individual tendencies of impulsive behavior. The questionnaire is shown in the appendix. It contained a passion scale measuring the individual proneness to impulsive behavior and a reason scale to measure the propensity to resist short-term incentive for the benefit of long-term goal

¹ Anna Anita Gatsos, Björn Gmähle, Melanie Fürst, Mariela Rance, Dorothea Schmidt

achievement. Once the questionnaire was finished, the participants were given a story with the instruction to read it aloud to the experimenter. The story was about a male or female character, matched with the subject's sex. In the negative mood condition, the story was about a person driving to work. By own fault, the person causes an accident during which a child is killed and is subsequently berated by a woman who had observed the accident. In a neutral- mood condition, the story described the daily work routine at a local tax office during which an employee is invited to a colleague's grillparty. After reading the story aloud, subjects were asked to focus on the situation as described and to imagine how they would feel like if they were in the situation depicted in the story. They were requested to write down in catchwords how this would be like. After this procedure, subjects were asked to sit down in front of the computer screen. On the computer, a german version of the frequency of emotion index (FEI; Simpson, 1990) was presented (Bierhoff and Müller, 1999). The FEI consists of 28 descriptive attributes half of which refer to positive emotions (e.g. joyful, happy, optimistic) and another half to negative ones (e.g. angry, irritated, distressed). The items were presented on the monitor and subjects rated whether the item reflected their current mood using a scale ranging from zero to nine. After subjects had answered the FEI, a mood freeze instruction was applied in all conditions. Subjects were told that recent research has proved that people could not improve their mood by e.g. drinking or smoking (eating was not mentioned), that mood is in fact more stable then is commonly assumed and that it would be more realistic to think that their mood would remain the same for the rest of the experiment. After that, the participants were instructed that during the next quarter of an hour, another task was to follow. The task was either an interesting or a boring one.

Interesting Task

As an interesting task, subjects were presented the „Executive Scroll Puzzle“. The puzzle consists of 24 pieces of wood painted green on one side. In order to solve it, one has to realize that some pieces fit only if being put in backwards. Subjects were presented the puzzle and told that it was rather difficult, but that they should not struggle to solve it in the given time. They were asked to try their best and said that later on, the experimenter would show them how to solve it. This was done in order to prevent that subjects would misinterpret the situation as a performance test. In fact, it turned out later that only two subjects managed to finish the puzzle in the given time. The experimenter then said that he would leave the participant alone and return after a quarter of an hour. When leaving the laboratory, he presented a bowl of cookies containing sweet and salty cookies of equal size and number. The number of cookies was counted before unbeknownst to the subjects, so that it would be possible to measure how many cookies were eaten during the session. The experimenter presented the cookies with the comment, that he meant to make the participants more comfortable in the laboratory.

Boring Task

In the „boring task“-condition, subjects were again presented a computer task. The experimenter said that the task was about visual recognition. One-digit numbers were presented on the monitor and the task was to type that very number on the keyboard. Again, it was said that speed was not important and that the experiment was not meant as a performance test. Rather it was stressed that correct responses were important. The rest of the procedure was exactly like the „interesting task“-condition.

Re-measurement of mood

After a quarter of an hour, the experimenter returned. Then, the FEI was administered again as in the beginning of the experiment. After that, the participants were debriefed and thanked for their participation. If they were students of psychology, 2 hours of experimental credit were given.

Design

The experiment had a 2 (negative vs. neutral mood) x 2 (interesting vs. boring task) factorial design.

Results

Passion and Reason Scales

The passion and reason scale consisted of 24 items each. A factor analysis was conducted first using the principal component method and subsequent varimax rotation. Two factors were identified one of which showed factor loadings above .30 of items measuring passion, i.e. individual proneness to impulsive behavior. The

second factor represented common variance of the items measuring reason, i.e. preference of gratification delay for the benefit of long-term goals. Using the results of the rotated component matrix, the passion scale was reduced to a list of 15 items, and in a similar vein, the reason scale was reduced to 9 items. Although the sample size of $N=40$ was considerably small, a comparatively high internal consistency was achieved. The passion scale, using Cronbach's α had an internal consistency of $\alpha=.82$, and the reason scale had a consistency of $\alpha=.79$.

Correlation of Passion- vs. Reason-Scales with Consumption of Food

Interindividual differences concerning impulsiveness as measured by the passion and reason scales were not related to the amount of cookies consumed in the experimental session, $r=.00$, $p=1$ (passion), and $r=-.06$, $p=.71$ (reason).

Manipulation Check: Mood Manipulation

In order to check whether the mood manipulation was successful, the FEI-items related to negative mood were compared between the two groups. Subjects in the condition „negative mood“ reported to feel significantly more sad, $F(1,37)=6.44$, $p=.15$, $\eta^2=.15$, gloomy, $F(1,37)=7.12$, $p=.01$, $\eta^2=.16$, downhearted, $F(1,37)=4.63$, $p=.38$, $\eta^2=.11$, and outraged, $F(1,37)=4.55$, $p=.04$, $\eta^2=.11$ than subjects in the neutral condition. On the other hand, subjects in the neutral condition reported to be more happy, $F(1,37)=6.06$, $p=.02$, $\eta^2=.14$, delighted, $F(1,37)=6.43$, $p=.16$, $\eta^2=.15$, content, $F(1,37)=4.44$, $p=.05$, $\eta^2=.01$, and optimistic, $F(1,37)=5.06$, $p=.31$, $\eta^2=.12$ than subjects in the condition „negative mood“. Thus, the manipulation of mood was successful.

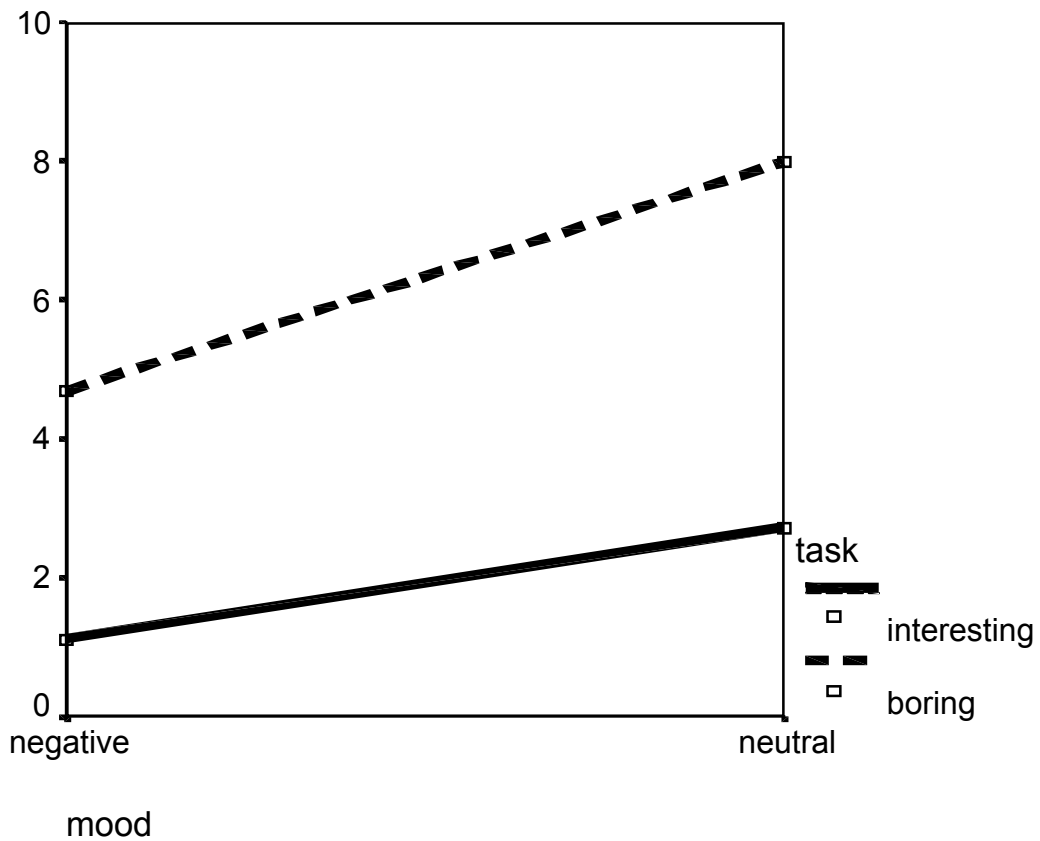
Influence of Mood and Task on Impulse Control

A two-way ANOVA was conducted to test the influence of mood and task characteristic on impulsive behavior. As a dependent measure, the number of cookies consumed by the participants during the experimental session was taken. In accordance with the mood regulation hypothesis, there was no significant main effect of mood on the consumption of food, $F(1,37)=2.85$, $p= .10$, $\eta^2=.08$. However, as was predicted by the arousal hypothesis, there was a significant main effect of the boring vs. interesting task, $F(1,37)=7.91$, $p= .01$, $\eta^2=.19$. More precisely, the mean for consumed cookies in the boring condition was $M = 6.34$ as compared $M = 1.91$ in the interesting condition. There was no significant two-way interaction of task by mood, $F(1,37)=0.31$, $p= .58$, $\eta^2=.00$.

The results of the two way ANOVA are summarized in Figure 1.

Figure 1

Consumption of Cookies as a Function of Mood and Task Characteristics



Mood Assessment – Correlations of First and Second Measurement

The correlation between the sum scores of the first and second mood measurement was $r=.70$, $p=.00$. In general, participants' mood was stable across the first and second measurement using the FEI. In particular, the correlations for the first and second measurement are summarized per item in table 1.

Table 1
Correlations of first and second measurement using the FEI

Nr	Item	r	p
1	ruhig (composed)	.05	.78
2	ärgerlich (angry)	.52	.00
3	aufgeregt (exhilarated)	.60	.00
4	zurückgewiesen (rebutted)	.59	.00
5	begeistert (enthusiastic)	.66	.00
6	neutral (neutral)	.42	.01
7	traurig (sad)	.55	.00
8	schuldig (guilty)	.16	.33
9	bedrückt (gloomy)	.63	.00
10	gelassen (serene)	.25	.12
11	ängstlich (timidly)	.51	.00
12	beunruhigt (worried)	.42	.01
13	gelangweilt (bored)	.47	.00
14	froh (happy)	.23	.15
15	angespannt (tense)	.53	.00
16	gereizt (petulant)	.49	.00
17	feindselig (hostile)	.40	.01
18	glücklich (lucky)	.55	.00
19	enttäuscht (disappointed)	.43	.01
20	uninteressiert (uninterested)	.52	.00
21	entzückt (delighted)	.60	.00
22	niedergeschlagen (downhearted)	.38	.02
23	leidenschaftlich (passionate)	.81	.00
24	genervt (nerved)	.52	.00
25	einsam (lonely)	.60	.00
26	zufrieden (content)	.38	.02
27	empört (outraged)	.68	.00
28	optimistisch (optimistic)	.70	.00

Discussion

The findings suggest that even with a comparatively small sample size, interindividual differences as regards proneness to impulsive behavior can be measured with sufficient reliability. However, the differences between subjects in the present study cannot be explained by such differences. To the contrary, the task characteristic, thus a situational variable, influenced impulsive behavior irrespective of mood. That such behavior, measured in terms of consuming cookies during the experimental session, was not influenced by mood can be explained in terms of the regulation hypothesis: Since all the subjects in the present study were given the mood freeze instruction, they could not expect to influence their mood by eating. However, the mood regulation hypothesis cannot account for the traceable influence of the task characteristic. In line with the arousal hypothesis, it was found that people in a boring condition tend to eat more than those facing an interesting task, irrespective of their mood. The arousal hypothesis is thus supported by the present study. However, the arousal hypothesis was discussed as part of a more general regulatory model allowing for affect regulation as well. A more comprehensive test of this reasoning would be an extension of the present procedure in terms of subjects' perceived influence on their mood: If we would repeat the present study adding third factor „perceived influence“, another two conditions would be comparable: If subjects expect to influence their mood, we would abide them to eat more in case of negative mood, irrespective of the task characteristic. On the other hand, if a mood-freeze instruction is given, we would expect subjects to eat more in a boring condition, but, as observed in the present study, irrespective of their mood. Thus, the perceived influence on one's mood could be the crucial factor for the interplay between mood regulation and self-stimulative behavior.

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