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Can Positive Mood Replenish Resource Depletion Resulting in Less Compliance through a Heuristic?

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Abstract

This study examines the effect of replenishment of self-regulatory resources after a depleting task, on compliance through a heuristic. The following three hypotheses were tested. Can positive mood replenish previously depleted self-regulatory resources? Do people comply more with a request when they are exposed to a compliance-promoting heuristic? Can replenishment through positive mood counteract the effect of regulatory resource depletion through less reliance on a heuristic? Results showed that none of the predicted effects occurred, but some other significant, partly reversed outcomes have been found. A short rest break did replenish depleted self-regulatory resources more than positive mood, and positive mood in itself had an effect on compliance. Together these results did not support the hypotheses, possibly due to the fact that mood induction and the heuristic activation did not work the way predicted and mood itself had an effect on the compliance measurement.

Introduction

In our daily lives the principle of influence is present, especially in the area of persuasion. Special techniques can be applied in different situations and nearly everybody has experienced the power of a social influence strategy. These techniques are very popular in daily marketing and sale. For example, the small gift one receives in a perfumery just before one buys a product, the general question to which one always agrees from a charity promoter, before he asks for a donation, or the friendly salesperson which makes us buy new shoes. These are all situations where people are influenced by others by complying with a request, which they might not have done without such a social influence strategy. But how can this happen as one is able to consider decisions carefully and thoughtfully?

Elaboration Likelihood Model

The fact is that people are neither motivated nor able to process everything attentively (Petty, Cacioppo, Strathman, & Priester, 2005). The Elaboration Likelihood Model describes two different routes of a continuum by which people can process information (Petty et al., 2005). The first is the central route which implies that a person pays careful attention to all information, relates this information to previous knowledge and carefully evaluates it. The person makes a decision or evaluation which was reached through thoughtful consideration and mental effort. This route requires that a person has the ability and the motivation to consider the decision carefully. An example where most people would follow the central route to persuasion is buying a car, which is a very expensive acquisition. Different cars have different functions and advantages, thus a person will probably evaluate information about various cars attentively to minimize the risk of buying an unsuitable or too expensive car.

Using the peripheral route, in contrast, one makes a decision without much thought. It depends more on automatic, habitual or routine processing. Thus people do not take all aspects into consideration and rely more on cues, which may lead to biased thoughts. This route is used quite often in daily life, as most people have developed evaluations for most objects in their environment, which easily come to mind when these objects are encountered. For example a person with a white coat is generally supposed to be a doctor, because people mostly meet doctors in a hospital where they have to wear these working clothes. Nevertheless this association does not have to be true as anybody can wear a white coat.

Further, the ELM model focuses on the variables that affect the amount of thinking a person applies. The first variable is ability, which in this context refers to the knowledge,

skills and opportunity of a person to evaluate an object. The second one is motivation of a person which affects a person's conscious intentions and goals in processing a message.

The central route leads to long-lasting and resistant attitudes that can influence further decisions and behaviour, compared to attitudes formed via the peripheral route (Petty, Haugtvedt & Smith, 1995). Concluding, when people are not motivated or able to process all information thoroughly, they automatically rely more on cues to guide their decision making.

Heuristics

Different social influence techniques cleverly use people's automatic tendency to rely on cues (Cialdini & Sagarin, 2005). These cues are also called heuristics. These are defined as "mental shortcuts that allow people to solve problems and make judgments quickly and efficiently. The rule-of-thumb strategies shorten decision-making time and allow people to function without constantly stopping to think about the next course of action. While heuristics are helpful in many situations, they can also lead to biases" (Tversky & Kahnemann, 1974). For example, a salesperson sometimes stresses the restricted number of a product in the presence of a customer. As a result the customer might conclude that this product is more valuable, because it is rare. This pervasive principle of compliance is called "scarcity" and is one out of five other principles described by Cialdini (1993). The other principles are: reciprocity, social validation, commitment/consistency, friendship/liking and authority. The three examples in the beginning also fall into the realm of these six principles. The reciprocity principle is applied if one gets something for free, so that one has the feeling one owes something to the other. In the example of the charity promoter the principle of consistency is present and liking can be found when sales persons behave very friendly.

A very simple, but effective heuristic is labelling people as helpful. In an article from Burger and Caldwell (2003), change in self-perception was tested by manipulating self-perceived helpfulness. They refer to the self-perception theory (Bem, 1972), which claims that people often determine their attitude by observing their own behaviour. In this study participants were either just requested to sign a homelessness petition or asked to give their signature and get 1$, or asked and afterwards thanked and told that they are very helpful. Besides these three conditions a control group was present, which did not receive any request. Two days later all participants were phoned and asked to help with a canned food drive. Results showed that labelling participants as helpful lead to a greater change in self-concept and greater likelihood of agreeing to the second request compared to unlabeled participants. Thus telling a people that they are helpful can function as a heuristic and this may influence

further behaviour. This result shows that there are very simple ways by which compliance to a request can be achieved through the use of a heuristic.

Limited resource model of self-control

The limited resource model of self-control (Muraven & Baumeister, 2000) gives a possible explanation why and when people are not in state to process all information they encounter deliberately, and thus fall back on the use of heuristics when confronted with a social influence strategy. It states that self-regulation is a limited resource, which is used for many different tasks which involve self-control or executive functioning (Schmeichel, Baumeister, & Vohs, 2003). This includes for example inhibiting impulses, regulating thoughts, and controlling emotions. This resource has a limited capacity and thus has impact on further processing. As the self is less able to function effectively because of used up resources, this might result in reliance on habit, routine and automatic processing (Baumeister, Muraven, & Tice, 2000).

Several studies support the theory of resource depletion, that an initial task of self-regulation worsens self-regulatory performance on following unrelated tasks. These studies mostly consist of two parts, an initial task to deplete the self-regulatory resource and a second task to measure this depletion. In one of several experiments from Baumeister, Bratslavsky, Muraven, and Tice (1998) participants were instructed not to eat three hours before the study, and the laboratory was filled with an aroma of freshly baked cookies. Furthermore, a bowl of radishes and a bowl of chocolate were set on a table. Three conditions were set up. In the first condition participants were instructed to eat some radishes, but not the cookies. In the second condition participants should only eat some cookies, and the third was a no food control condition. Afterwards, all participants did an impossible problem-solving task in the form of a puzzle. Results showed that the participants who were forced to eat radishes instead of chocolate quitted sooner with the puzzle than participants in the other two conditions, which did not differ in the time spent on the puzzle. Resisting the temptation of eating cookies in the beginning exhausted the resource of self-regulatory resources; therefore participants had fewer resources for the second task which made them give up more quickly on the puzzle.

Other studies used different tasks in the first as well as in the second part. Muraven, Tice, and Baumeister (1998) showed that participants, who had to regulate their emotional response to an upsetting movie, squeezed a handgrip for a shorter time than participants who were allowed to show their emotions during the film. Furthermore, Schmeichel et al. (2003) conducted a study where participants had to control their attention or regulate emotions. Both

initial tasks let the participants perform worse on cognitive tests compared to people who had no instruction for the initial task. Baumeister et al. (1998) also demonstrated that people prefer to behave more passively after an act of self-regulation. Vohs, Baumeister, and Ciarocco (2005) showed that depleted people are less able to present themselves effectively in interactions with other people. They behave more habitual and rely more on over learned patterns of self-disclosure.

All these studies show that self-regulation is a limited resource and that it affects performance on different tasks that require some energy of this resource. This resource influences the way of responding to the environment and information processing, as depleted people rely more on habits, automatic processes and cues. Thus people sometimes just do not have enough energy to process information deliberately and therefore rely on simple cues or heuristics. This effect can be used successfully in the area of persuasion, as depleted people might not have enough self-regulatory resources to resist a social influence strategy.

A study by Fennis, Janssen and Vohs (under review) demonstrated this effect of resource depletion and reliance on a heuristic. All participants first got a typewritten sheet of paper where they had to cross out the letter “e” each time it occurred. Then half of the participants were depleted through crossing of the letter “e” while consulting multiple rules when and whether to cross off occasions of the letter “e”. The non-depletion condition just did the first task again. Then for half of the participants, the heuristic principle of reciprocity was induced, by telling them that they originally had to do a further very boring test, but that the experimenter would free them from this one, because he had enough data already. The concession of the experimenter should be followed by a counter-concession by the participants, referring to the principle of “reciprocity”. Results showed that depleted participants complied significantly more often if the principle of reciprocity was present. If the heuristic was absent there was no difference in compliance between the depleted and the non-depleted participants. This supports the hypothesis that lower levels of self-control promote the reliance on a heuristic in a persuasion context.

This result was replicated in a study by Janssen, Fennis, Pruyn, and Vohs (in press). In this study “authority” was used as a heuristic, because people comply more if an authority is present (see Cialdini, 1993). Depleted participants donated more money if a charity organisation was presented as an authority compared to a non-authority organisation.

All in all, the limited resource model gives a reason for why people cannot always process all information thoroughly and therefore use the peripheral route by relying on heuristics and cues in the environment. The question automatically arises how long this state

of resource depletion lasts, and whether it is possible to replenish the depleted resources? Furthermore, it would be interesting if replenished resources lead to better resistance to social influence strategies, as people are more able to process information thoughtfully again?

Replenishment of self-regulatory resources

The preceding paragraph demonstrated that self-regulation is a limited resource and that this, if depleted, can affect further processing and reliance on heuristics. The next paragraph will be concerned with how depletion can be counteracted and the resource of self-regulation can be filled up again.

Positive emotions have been shown to bring back the ability of self-regulation (Tice, Baumeister, Shmueli, & Muraven, 2007). Positive feelings are linked to general bodily arousal with components of energy and tension (Thayer, 1989). This effect may counteract self-regulatory depletion, which can lead to tiredness (Baumeister et al., 1998). A study by Tice et al. (2007) demonstrated this possibility of refilling the self-regulatory resource. Participants in the experimental condition were first depleted by suppression of a certain thought and then half received a surprise gift in the form of some candies. The control group had no instructions concerning the thoughts and also half of them got some candies. Afterwards all participants were asked to drink as much as possible of a very bad tasting, but healthy beverage. Results revealed that the depleted participants who received a surprising gift drank as much of the drink as the non-depleted participants and depleted participants in the no-gift condition drank significantly less. Thus the happy mood seems to have eliminated the effect of the depletion by replenishing the self-regulatory resource. Those participants had as much self-regulating resource as the non-depleted participants.

In following studies this result was replicated. Depleted participants who watched a comedy film worked as long on a frustrating computer game or squeezed a handgrip as long as non-depleted participants. Compared to the other conditions, depleted participants who watched a neutral or sad film persisted for a significantly shorter time on these tasks.

These experiments show that it is possible to replenish depleted self-regulation by influencing mood in a positive way. Thus positive emotions can give back some of the used up resource after a self-regulatory task.

Present research

In the present research, the question of whether replenishment of self-regulatory resources leads to more resistance to a social influence strategy is central. Thus in this study,

besides the depletion of self-regulatory resources and the possible following reliance on a heuristic, the effect of replenishment of self-regulatory resources on the use of a heuristic will be tested. As previous studies showed depleted self-regulatory resources can be replenished (Tice et al, 2007). This effect should be replicated in the present experiment. Furthermore the influence of a heuristic will be tested. Referring to Cialdini (1993) it is expected that the presence of a heuristic will lead to more compliance to a request, and to a greater degree if people are previously depleted as shown in the study by Fennis et al. (under review). In addition, the interaction effect of replenishment and a heuristic is of interest. If replenishment after a depleting task is possible, then one probably relies less on a heuristic, resulting in less compliance with a request. Thus it is expected that depleted and then replenished persons will comply less due to a heuristic compared with persons who are not replenished after a depleting task, or when no heuristic is present.

This study consists of one experiment which includes four main steps. First, all participants will be depleted with a task which requires self-regulatory resources. Next, people's regulatory resources will be replenished by inducing a positive mood state, by watching a funny video. Participants in the control conditions will either watch a film sequence which causes a negative mood state or no film at all. Their degree of depletion will be measured after this part of the experiment. Afterwards half of the participants will be exposed to a heuristic, which consists of labelling them as helpful persons. Subsequently, all participants get the possibility to donate money to a charity organization.

According to the hypotheses it is expected that participants are replenished if they see a film which induces a positive mood, in contrast with people whose mood state is not manipulated in a positive way. Furthermore, participants who are labelled as helpful will donate more money compared to those participants who are not labelled as helpful. Moreover those people who are replenished by the positive mood film will rely less on the heuristic and thus will donate less money compared to participants whose self-regulatory capacities are not replenished. In other words, when positive mood replenishes regulatory resources, there will be no effect of resource depletion on compliance through a heuristic, thus making people more resistant to persuasion.

Method

1. Overview and Participants

This study took place in the laboratory at the University of Twente in Enschede. Participants´ self-regulatory resources were diminished, then either replenished or not and in the end they were exposed to a self-perceived helpfulness heuristic or not. The percentage of money donated to a charity organization was used as a measure for compliance. The study employed a 3 (replenishment-induction: positive mood vs. negative mood vs. neutral mood) X 2 (heuristic-activation: helpfulness label vs. no label) between-subjects factorial design. A total of 111 students participated in this study and received a course credit and € 2,50 or € 6,50, but due to extreme scores seven participants were left out in the analyses. Thus 104 participants (39 male, 65 female) were included in the latter analyses of this study, their age varied from 18 to 40 years (M = 21.53, SD = 3.04).

2. Manipulations

Prior to arrival at the laboratory, participants were randomly assigned to one of the six conditions. Participants were told that they would take part in an experiment about consumer opinions. They all filled in an informed consent and received their money for participation when they were seated behind a computer in the test room. The experiment began for all participants with filling in demographic variables containing age, nationality and gender, followed by a bogus questionnaire, supposedly measuring their helpfulness as a personality characteristic. This questionnaire contained four items (α = .70), which had to be rated on a 7-Point Likert scale, on how appropriate the statements described the participant´s personality; an example is “helping makes me happy”. All participants were informed that the computer would calculate their scores on this questionnaire while they continued the experiment, and that they would later on receive feedback on their scores. Last, the participants filled in a self-control scale (Tangney, Baumeister, & Boone, 2004). Examples of questions are, “I am lazy” (reversed scored) or “I spend too much money” (reversed scored). Participants had to rate on a 7-point Likert scale to what degree these statements described themselves. The questionnaire contained 36 items and the average score served as a measure of dispositional self-control (α = .85).

2.1. Depletion-induction

All participants were put into a state of resource depletion with a self-control task. This consisted of a dense text about statistical analysis which had to be typed over as fast as possible with all capital letters and punctuation marks, but without the letter "e" or the "empty spaces" (see Muraven, Shmueli, & Burkley, 2006). After each sentence participants had to click "enter" so that the text was copied in a box on the screen.

2.2. Replenishment-induction

To replenish participants' regulatory resources, a positive mood state was induced by watching a part of the film "The Muppets", where funny looking puppets sing the song "manamana". In the first control condition, the negative mood group, a part of the film "Schindler´s List" was shown. The fragment showed Jewish people in a concentration camp, how they were humbled, tortured and killed by the German soldiers. During the whole film very sad and slow music was played. These films have been adapted from a study by Hermsen, Holland, & van Knippenberg (under review). Both films lasted approximately two and a half minutes. Participants in the second control condition were given a rest-break that lasted the same amount of time. Afterwards, all participants filled in three questions to assess their mood states ($\alpha = .91$). These questions consisted of contrasting adjectives, each at one end of a 7-Point Likert scale; an example is "happy vs. sad" (reversed scored). The participants had to cross the number on the scale which best described their momentary feelings.

The State Ego Depletion Scale (Ciarocco, Twenge, Muraven, & Tice, under review) was used to calculate the degree of depletion of the participants ($\alpha = .93$). This scale consists of 25 items; examples are "I feel motivated" (reversed scored) or "I want to give up". Participants rated on a 7-Point Likert scale how good these sentences described how they felt at the moment.

2.3. Heuristic-activation

This part was followed by the activation of the self-perceived helpfulness heuristic, which consisted of giving feedback about the scores on the helpfulness scale. All participants were told that the computer had analysed their answers on the personality questionnaire in the beginning. Half of the participants were informed that their scores on the helpfulness scale were above average and that they thus are more helpful than an average student. The other half got an average score on the questionnaires and no further feedback.

3. Dependent measure - Compliance

The dependent measure of this experiment was compliance due to a charitable request. At the end, participants were told that the experiment was over, but that the scientists of this experiment support the Dutch Support Group for Tibet. Some information concerning this charity organization was presented before the participants were told that they had the possibility to donate some money for Tibet. A collecting-box with the logo of the organization, which already contained € 2,50, had been placed beforehand next to the screen of the computer.

When the participants left the laboratory it was checked if and how much the participant had donated. The fraction of the money donated relative to the money previously received served as a measure of compliance. All participants were debriefed and thanked. The total amount of money donated during the experiment was transferred to the Dutch Support Group for Tibet.

Results

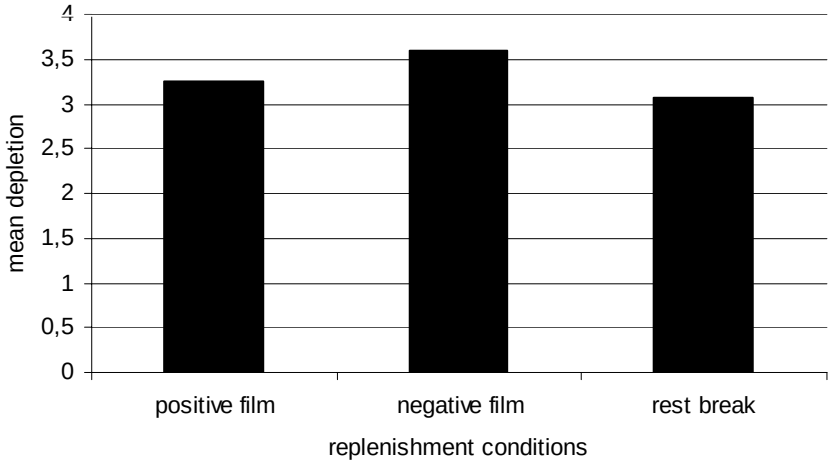
Manipulation Check of Mood

The manipulation check of the different film conditions revealed a significant effect of the different conditions on participants´ mood state after the film, $F(2,101) = 32.45$, $p < .001$. Participants in the negative film condition ($M = 3.41$, $SD = 1.06$) rated themselves significantly less happy than participants in the positive film condition ($M = 5.35$, $SD = 1.13$) and the no film condition ($M = 5.09$, $SD = 1.02$). There was no significant difference in the scores on the mood scale between participants who saw the positive film and participants in the no film condition who had a short rest break.

Depletion

To test whether positive mood actually replenishes regulatory resources an ANOVA was conducted which showed a significant effect of replenishment-condition on depletion, $F(2,101) = 3.33$, $p < .05$. Those participants that did not see any film, but had a short break, scored significantly lower on the State Ego Depletion Scale ($M = 3.07$, $SD = .81$), thus indicating that they were less depleted, compared to participants in the negative film condition ($M = 3.60$, $SD = .92$), $p < .05$. The positive film condition ($M = 3.25$, $SD = .78$) did not differ significantly from the negative film condition or the no film condition (see Figure 1).

Figure 1: Mean depletion in the replenishment conditions



Compliance

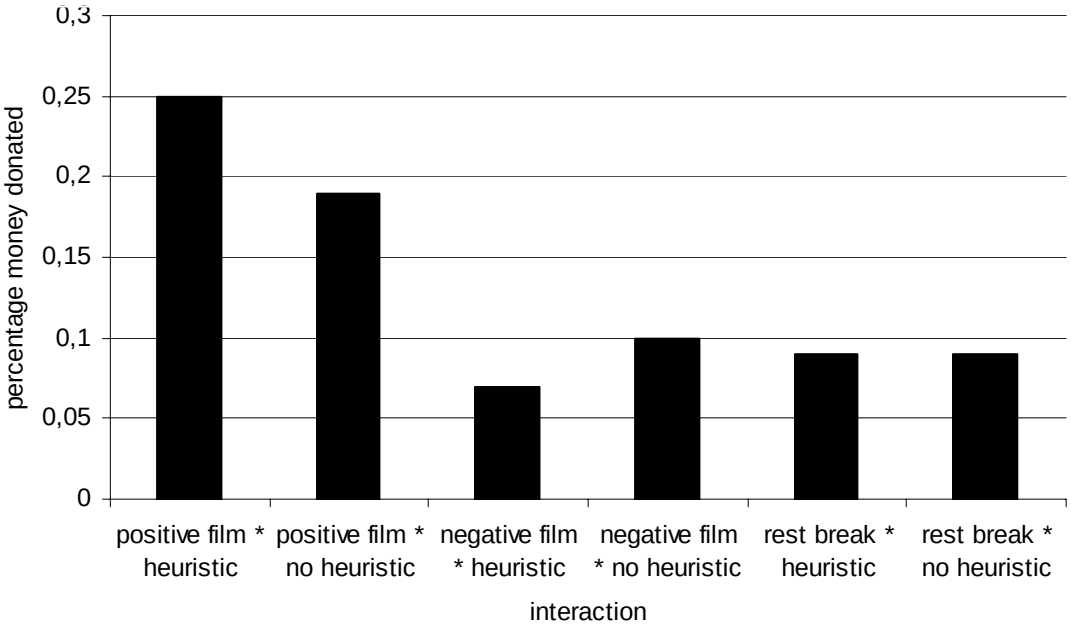
To test whether a state of resource depletion increases the chance of compliance through a compliance-promoting heuristic, and whether replenishment through positive mood

can counteract this effect, another analysis of variance was conducted. No significant main effect of the heuristic principle of self-perceived helpfulness was found, on the percentage of money participants donated, $F(1,98) = .06$, $p = .81$. Thus there was no difference in donation between those participants who were exposed to a heuristic ($M = .14$, $SD = .26$) and those who were not ($M = .13$, $SD = .27$).

The interaction effect of replenishment and heuristic on the percentage of money donated was also not significant, $F(2,98) = .28$, $p = .76$. The heuristic did not have a simple main effect within the interaction of replenishment and heuristic; not in the positive mood condition ($F(1,98) = .59$, $p = .45$), not in the negative mood condition ($F(1,98) = .06$, $p = .81$) and not in the no film condition ($F(1,98) = 0$, $p = .97$).

The simple main effect of replenishment within the interaction of replenishment and heuristic was only marginally significant when the heuristic was activated ($F(2,98) = .28$, $p = .07$), and not significant at all when the heuristic was not activated ($F(2,98) = .28$, $p = .43$). Anyhow, some individual significant effects of replenishment in the interaction with an activated heuristic on donation where found. If the heuristic was present, the positive film condition donated a significantly larger percentage of money ($M = .26$, $SD = .39$), compared to the negative film condition ($M = .07$, $SD = .13$); $p < .05$, and also compared to the no film condition ($M = .09$, $SD = .11$); $p < .05$. There was no significant difference in donation between the two control conditions, negative film and the no film, when the heuristic was activated (see Figure 2).

Figure 2: Mean percentage of money donated when heuristic is activated in combination with the replenishment conditions



Although this effect was not part of the hypotheses, the results show a significant effect of the positive film on donation, $F(2,98) = 3.37$, $p < .05$. A marginal significant trend was discovered, in that participants who saw the positive film donated a larger percentage of money ($M = .22$, $SD = .37$) compared to participants in the negative film condition ($M = .09$, $SD = .17$); $p = .09$, and the no film condition ($M = .09$, $SD = .14$); $p = .08$.

Self-control

To control the previous results for any dispositional self-regulatory resources of the participants, a median split on the self-control scale scores was carried out. An analysis with ANOVA, which tested the effects of mood and heuristic on the percentage money donated, looked first at the group with high dispositional resources and second at the group with low dispositional resources, but revealed no significant effects.

Nonetheless a further simple main effect of replenishment in the interaction with the heuristic was found, for participants who scored high on the self-control scale. These participants donated a significantly larger percentage of money when they saw the positive film and the heuristic was present ($M = .30$, $SD = .42$), compared to the negative film condition ($M = .05$, $SD = .07$); $p < .05$. A marginal significant difference was found between the positive film condition and the no film condition ($M = .09$, $SD = .11$); p = .09, and no significant difference between the negative film condition and the no film condition. Further significant simple main effects of the variable replenishment in the interaction or the variable heuristic in the interaction were not found.

Discussion

Explanation of results

Though the hypotheses could not be confirmed, significant effects were observed and interesting insight concerning the role of mood on donation behaviour and the effect of a short break on replenishment on self-regulatory resources could be gained. In the following, reasons and explanations for the findings will be given and discussed.

Hypothesis 1 stated that positive mood can replenish depleted self-regulatory resources. It was expected that the induction of a positive mood state would counteract the effects of previous depletion. This would have lead to a lower score on the State Ego Depletion Scale (Ciarocco, Twenge, Muraven, & Tice, under review), compared to the control groups, the negative mood state and the neutral mood state in the form of a short rest break. However, the findings showed that those participants who saw the positive film after the depletion task did not score significantly lower on the State Ego Depletion Scale compared to the negative film condition and the no film condition. Obviously the positive film did not replenish self-regulatory resources. But a not predicted significant effect of participants in the no film condition compared to the negative film condition was found. The participants who had a short rest break scored significantly lower on the State Ego Depletion Scale, thus indicating that they were less depleted than the participants in the negative film condition. According to these results it seems that the short rest replenished the depleted resources of participants more than the positive mood. The replenishing effect of rest on self regulatory resources has already been found by Baumeister and Exline (2000), but until now this effect has been only expected if the rest was longer. In study by Tice et al (2007) participants had a rest of five minutes and this did not replenish participant's regulatory resources. The present study shows a contrasting result. Even a very short rest of two or three minutes has a replenishing effect on self-regulatory resources. This effect is suggested by the scores on the State Ego Depletion Scale (see Figure 1), where the short break condition scored lowest, though only significant compared to the negative film conditions.

Looking at the manipulation check of the mood induction, it becomes clear that the positive film probably did not work the way predicted. It has been expected that the positive film would increase the degree of positive emotions, that the negative film would increase the degree of negative emotions and that the no film condition would function as a control measure by leaving emotions unchanged. The manipulation check indicates that this effect did not occur. Participants in the negative film condition rated themselves as significantly less cheerful

compared to the two other conditions. The positive film did not significantly increase positive mood compared to the no film condition, thus there was no difference in mood between those participants. The negative film worked very well by inducing negative mood, but the positive film seems to have failed to stimulate positive mood. The debriefing, where participants had to describe the films with one word, showed that very strong and negative adverbs have been used in the negative film conditions. Examples are “horror”, “terrible” and “inhuman”. These words all carry a very strong, negative meaning in themselves and illustrate that the negative film really caused the negative mood state. The debriefing of the positive film showed on the one hand very positive adverbs, for example “funny” and “cheerful”, but on the other hand also words with a negative meaning, for example “irritating”, “impatient”, “dull” and “strange”. Referring to this debriefing it becomes clear that the film sequence from “the Muppets” has not always been perceived in the positive way expected. This effect might be explained by the maturation process in which students mostly are. They are in a developmental phase where they take over responsibility and increase their critical thinking (Mines, King, Hood, & Wood, 1990). The film about “the Muppets” might not have suited their current intellectual situation and thus did not affect the students´ mood in a positive way. This might also explains why the positive mood condition did not always replenish depleted self-regulatory resources, as shown by the scores on the State Ego Depletions Scale. In addition the positive film could not develop its positive potential in the environment and placement of this study. The laboratory in a university, which is an educational and earnest place, might have interacted with the treatment (Dooley, 2001) and primed participant’s reactions.

The second hypothesis stated that the presence of a heuristic would increase compliance, measured by the percentage of money donated. This effect was not found in this study, possibly because the heuristic principle of self-perceived helpfulness did not work the way it was expected. The heuristic was activated by giving participants feedback about their scores on a helpfulness questionnaire they filled in at the beginning of the experiment, telling them that they were very helpful. The problem with this kind of heuristic might be that it was provided by a computer and not by an experimenter of the study. The study from Burger and Caldwell (2003), where this kind of heuristic worked well, differed to the present study in that respect. The labelling of the participants as helpful happened through a confederate. It might be that that such personal feedback does not have an effect when given by a machine, because it appears artificial and less relevant. Although a study from Punya (2006) showed that people do respond to praising or blaming feedback from computers by accepting it, but do not process it in the same deep way compared to a feedback from a person. This might be the reason why the

change in behaviour found in the study by Burger and Caldwell (2003) did not occur in the present study.

Furthermore it might be that some participants suspected that the amount of money donated was measured and then refused to comply with the request. A study by Brehm (1966) showed when people noticing some one is trying to change their mind, become more motivated to defend their position. This result may also be transferred to a behavioural level. When some participants thought that the donation was a measurement and that the previous manipulation should influence their donation, they might have refused to donate at all. This possible effect may also be of importance for the results of the third hypothesis.

The third hypothesis of the present study stated that people who are depleted will more likely comply with a request when a heuristic is present, and that replenishment through positive mood would counteract this effect. Thus it was expected that participants who were depleted and saw the negative film or had a short rest break would donate a significantly larger percentage of money when labelled as being helpful. No effect of labelling people was expected if people were replenished through the positive film. The prove of these predictions face the problem that the films did not induce the mood intended and thus the predicted replenishing effect of the positive mood film did not happen. This is mirrored in the results of the analysis. The participants exposed to the negative film or no film and the heuristic did not donate more money. Actually reverse significant effects were found, namely that people who saw the positive film generally donated more money and even more when labelled as helpful (see Figure 2). Thus both parts of the third hypothesis did not prove right. Depleted participants did not donate more money when exposed to the heuristic and those participants who should be replenished did not donate less money and were sometimes influenced by the presence of the heuristic. Furthermore did the heuristic not have any general effect at all on the three conditions, no matter which film was shown. Thus the hypothesis could not be proved right again, as the heuristic should only show no effect when people are replenished. An explanation is of course that the films did not influence mood and replenishment in the proposed way. A short rest break replenished the depletion in a similar way or even more as the positive film. Thus the third hypothesis has to be adapted to this additional parameter.

Nevertheless the general significant effect on donation when people saw the positive film and also the simple main effect of the positive film in combination with the heuristic deserve an explanation (see Figure 2). In this study positive mood was used as replenishment, but mood itself can influence people's thoughts and behaviour. Several studies support the idea that good mood has a positive effect on helping behaviour. An example of a study is an

experiment carried out by Aderman (1972). Participants who read elation statements were more willing to help the experimenter afterwards compared to participants who read depression statements. Taking this finding into account when explaining the effect of mood on donation in this study, it becomes clear that the positive film may have directly affected helping behaviour and thus the donation. Participants whose moods were positively influenced by the film sequence from "the Muppets" were more inclined to help the people in Tibet through a donation than participants who were in the negative film or rest break condition.

In the following aspects of the interaction between the positive film condition and the heuristic found in this study will be discussed. First, it is known that even labelling people as charitable can have a positive influence on their mood state and result in more helping behaviour (Kraut 1973). This finding may explain the simple main effect of mood in the interaction with the heuristic. But why did the positive effect of this heuristic on mood and on donation did not occur in the other conditions? This can be explained by the finding that mood can also influence the way stimuli and information are processed. People, who are in a good mood process messages less systematically (Bohner, Crow, Erb, & Schwartz, 1992). Those participants whose moods were influenced in a positive way did not think deliberately and critically about the heuristic compared to participants who were in a more negative mood. Thus the fact that the heuristic was provided by a computer might not have affected people in the positive mood condition. As a result those participants were more influenced by the heuristic than the others and therefore donated more money.

Second, according to the hedonic contingency model from Wegener and Petty (1994), people try to attempt or maintain a positive mood and process stimuli due to their current mood state. People in a positive mood will just process messages that do not reduce this and thus are very carefully scrutinizing the hedonic consequences before they deal with it. In contrast people in a negative mood do not have anything to lose and thus do not examine cautiously the effect of a message on their mood. Thus it might have happened that those participants, who found the Muppet film positive, were more influenced by the heuristic, which can also be seen as a compliment, because it fitted their mood state. (The fact that the heuristic was given by a computer again does not seemed to be of relevance in this case). Participants in the other conditions were in a less good mood state and thus not very interested in processing the positive feedback.

Concluding it may be possible that the variable mood, which should actually just replenish, had further unpredicted, strong effects on the participants. Positive mood may have influenced their mental processing of messages and donation behaviour. The replenishing

effect of positive mood, which should lead to less compliance, was most probably overshadowed by the effect of positive mood on helping behaviour and/or the wish to maintain positive mood through the donation.

Another significant effect was found which actually was not predicted by the hypotheses. The dispositional self-control scale has been added to this study to look for differences between people high and low in self-control. If participants scored high on this scale and saw the positive film and then were exposed to the heuristic, they donated significantly more money compared to the negative film group. An explanation for this effect might be that people with more self-regulatory resources were further depleted by the negative film, because they are predisposed and in this case also stimulated to develop critical and deliberate thoughts. Thus those who saw the positive film compared to the negative film had enough resources left to process the heuristic carefully. This combination then may have led to a deliberate processing of the information about Tibet, which resulted in a higher donation. Furthermore it might be that people low in self-control did not care about the heuristic and the donation, as they just did not have enough resources left to think carefully about these stimuli. These explanations are presented here as a first idea and need to be pursued more carefully in the future. In particular it has to be made sure that this finding is not an experimental artefact. In the following further ideas for future experiments and improvement of the present study will be discussed.

Future experiments

This study gives some incentives and instructions for following studies. In general this study shows that the variable mood has to be handled very carefully, because it is difficult to control and its effects people's behaviour in a manifold way. Thus when using a film to induce a positive mood state to replenish participants' self-regulatory resources, a pre-test is necessary to be sure about the effect of the film. The acceptance of the film is difficult to predict and dependent on the personality of the viewer. In any case it would be interesting to explore other ways to induce positive mood and thus replenishment of the self-regulatory resources.

Another issue for future studies may be the effect of mood on the influence of a heuristic. Do people in a positive mood are more influenced by a heuristic than people in a negative mood? What are the specific mood conditions enlarging heuristic influences?

Some aspects of personal feedback during this investigation became important. It should not appear artificial and its purpose should be hidden, otherwise unwanted reactions of the participants might occur. It would be interesting to explore more deeply how the computer

as feedback provider influences the effectiveness of different heuristics in different mood states? Furthermore other heuristics and their effect on compliance would be an interesting topic of future studies.

A last interesting issue for following studies is the replenishing effect of a break. How long does it take to replenish depleted self-regulatory resources? There might also be different amount of times needed to fill up resources for different depleting tasks. Do special depleting tasks require more time for the self-regulatory resources to replenish?

Practical implications

This study has implications on the area of social influence, because it demonstrates restrictions and proposes new ideas in the understanding and controlling behaviour. The present study shows that mood is a complex variable, which has various effects on other variables. In a previous study positive mood replenished depleted self-regulatory resources. In this study another effect of mood became apparent: the direct effect of positive mood on donation. If people were in the positive mood condition they donated a higher amount of money. This outcome was already considered in the field of social influence strategies (see Aderman, 1972). An example where this finding is already applicable is a charity organization. By setting people in a positive mood organizations are able to gather more donations for a charitable goal. This strategy was demonstrated impressively during the recent European Championship in soccer. In a fund raising commercial in the German Television during breaks of the games from the Red Cross for victims of mines in Afghanistan, one legged children and their healing was displayed with simple, childish drawings. The viewers' good mood was not destroyed by horrible pictures of the reality.

In addition to this effect already known, this study suggests that in a good mood state heuristics are more effective even if it is given in a way not generally working. This finding can be of relevance for future fund raising strategies. When strategies imply a good mood induction following heuristics can be used to achieve even more compliance.

By considering this main effect of positive mood on donation restrictions for scientific experimental studies become obvious. If positive mood directly influences donation behaviour, it would not be possible to combine positive mood as replenishment and donation as a measure for compliance.

Furthermore the present results have significantly shown that even a very short rest can replenish participant's depleted self-regulatory resources. Short breaks could be used in situations in daily life were depletion plays a role and governs behaviour. This might give rise

to new strategies resisting influences which rely on previous depletion of peoples self-regulatory resources. An example would be to teach people to take short rest breaks during shopping, to keep the ability to consider evaluations and purchases of products carefully. On the other hand marketing strategies should avoid even any short breaks when they are based on the depletion principle. Another example of an application would be strategies in school. Students might be instructed to take always a short break after each exercise in an exam. However, since conflicting results concerning the effectiveness of a very short break can be found in literature and the replenishing effect of breaks has an influence on numerous areas it is of practical interest to verify this effect more detailed.

All in all this study showed very interesting effects and problems which give rise to further questions for future studies, as well as concrete practical implications in real life. The concept of mood, its generation, and its effects on human beings, which were actually not taken into account by the hypotheses, turn out to be a central aspect in this study.

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