
Resource depletion and persuasion: The moderating Role of the heuristic principle of reciprocity

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Abstract

The present article examines the effect of regulatory resource depletion on the amount of compliance, through the use of a heuristic, which either promotes compliance or enhances resistance to persuasion, in particular the heuristic principle of (reversed) reciprocity. Results partly indicate that a state of regulatory resource depletion diminishes self-regulatory resources. It appears that counterargument is a self-regulatory process that can be weakened when self-regulatory resources have previously been reduced. Moreover, we did not find significant results for a higher compliance rate when the heuristic principle of reciprocity was used, or a lower compliance rate when reversed reciprocity was used. Notwithstanding, a tendency can be seen in the desired direction. Specifically, participants were overall more willing to comply when the request was preceded by the heuristic which promotes persuasion than when the heuristic was used which promotes resistance to persuasion or when no heuristic was used. Further, the present study did not find an interaction between depletion induction and heuristic activation on compliance rates. As a consequence, the results of the present study indicate that the heuristic principle of reciprocity apparently does not have a moderating role in the effect of depletion on compliance. Taken together these results show that it is important to take self-regulatory resources into account in a social influence situation.

Introduction

Imagine you are walking around downtown and that a friendly young man starts to involve you in a conversation. After talking to you for a while, he is trying to persuade you to sign a membership form in order to become a member of a book club. In return he gives you a small present, for example a bookmark. Would you comply with his request?

In many situations, similar to this, people are targeted with a social influence technique which attempts to persuade a consumer in a witty way. As can be seen from this example those who seek to persuade us seek to create or change our attitudes, opinions, or behaviours in a particular direction. Thus, the key targets of persuasion are our attitudes, opinions, and of course our behaviour. The present article focuses in particular on behavioural changes which follow from clever social influence strategies.

Social influence strategies

The field of social influence strategies is famous for its demonstration of psychological phenomena that mostly occur in direct response to explicit social forces. One of the most memorable demonstrations of social influence strategies came from Stanley Milgram. In the early 1970's, researcher Stanley Milgram stunned the world with his study on obedience. Milgram demonstrated that the majority of participants would deliver harmful electric shocks to another person despite protests from the victim (Milgram, 1974). In this prominent representation, the targets of influence were confronted with explicit social forces that were within conscious awareness (Milgram, 1974).

In everyday life the situations one encounters with social influence strategies are not as extreme as in Milgram's study. However, the world of today is an environment dense with influence attempts. Advertisers overwhelm us as consumers with numerous ad campaigns designed to sell cars, food, drinks, sneakers, computers, services and many more. Likewise, politicians make speeches and kiss babies to win votes. This shows, that social influence strategies are used in many domains.

Certainly, it can be said that every one of us has had the experience of complying to an influence agent's request. These requests vary according to the goal the influence agent has in mind. Examples include donating money for a charity, signing a petition, volunteer to invest time and effort, buying a product, and many more. Think about this for a moment, have you ever encountered a situation where you became the target of an influence agent? Did you comply with the request, or was it possible for you to resist? Influence agents know that if he or she can manage the situation and choose the correct technique, the response to his or her

technique will be successful. This means that we, as influence targets, become influenced or even persuaded by the influence agent.

As can be seen in many everyday situations it is often difficult to resist a request made by an influence agent. More important, it seems that many of us are not even aware of the thousands of times each day we are influenced by someone else. Most people are either unaware of these influences (mindless), or when they are, they greatly overestimate the amount of freedom they have to make up their own minds.

In a classic study of automatic responses (Langer, Blank, & Chanowitz, 1978) this is demonstrated. In their study it becomes apparent that people seem to respond mindlessly when confronted to a social influence situation (Langer, 1992). In this study, a researcher asked a small favour of people who were waiting in line to use a library copy machine: “Excuse me, I have five pages. May I use the Xerox machine because I’m in a rush?” As a result, 94% of those who were asked let the researcher go ahead of them in line. This elegant demonstration shows that we are vulnerable to techniques that elicit automatic responses (Langer et al., 1978). It becomes obvious from this study that people often act without thinking about the context or situation they encounter. The heuristic used here was a senseless reason (“because I’m in a rush”), and although this reason did not make sense the majority of participants complied. It seems as if the appearance of a reason, triggered by the word “because”, was all that was necessary.

This and many other studies in the field of compliance frequently show that consumers often automatically use simple heuristics when confronted with persuasive messages, without analyzing all decision-relevant information (Cialdini & Goldstein, 2004; Langer et al., 1978). A heuristic is a mental shortcut that allows 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 (Kahneman, Slovic, & Tversky, 1982).

While heuristics are helpful in many situations, they can also lead to biases (for example, Chaiken & Trope, 1999; Tversky & Kahneman, 1974). Such a bias can be observed in the study by Langer et al. (1978). The use of the “because” heuristic, even if it was senseless, led to a disadvantage for the subjects. Participants let the researcher go ahead in line because of a reason which sounded reasonable but offered no real reason to comply. This study points out that it is often the case that we, as consumers or influence targets, make use of heuristics; the word “because” alone was enough to trick subjects into submission. Generally, it can be said that we use these heuristics to make our daily lives easier.

Several decades of studies on social influence techniques verify that consumers are induced to comply with a request at a much higher rate when they come in contact with a social influence technique than when the request is made without this technique (Cialdini & Goldstein, 2004; Cialdini, 2001). A number of studies have shown that this probably occurs because people make use of decisional heuristics (see for example, Fennis, Janssen, & Vohs, under review; Langer et al. 1978).

These heuristics are often embedded in a social influence strategy, for example, the Door-in-the-Face technique (Cialdini et al., 1975; Cialdini, 2001) and the Foot-in-the-Door technique (Freedman & Fraser, 1966).

The Door-in-the-Face technique is used by requesters by beginning with an extreme request that is sure to be rejected and then retreating to a more moderate request, the one the requester had in mind from the outset (Cialdini et al., 1975; Cialdini, 2001). The goal is to get the person to agree to the moderate request, which seems reasonable compared to the extreme request at the beginning. The requester hopes that the retreat from the extreme request to the moderate request will encourage the person to make a reciprocal concession, by moving from initial rejection of the larger favour to acceptance of the smaller one (Cialdini et al., 1975; Cialdini, 2001).

The Foot-in-the-Door technique is based on the commitment/consistency principle. First, a salesperson using this technique will ask for a small initial request that the consumer cannot easily refuse. Then, the initial compliance is followed by a request for a larger related favour. As a consequence, people who agree to the initial small favour are more willing to agree to the larger one in order to be consistent with the implication of the initial action (Burger, 1999; Freedman & Fraser, 1966; Cialdini, 2001).

Beyond the heuristics which are used in the examples mentioned above there are more of which fundraisers make use in a clever way. The following principles can also be used to motivate us to comply with another's request: social validation, friendship/liking, scarcity, and authority (Cialdini, 1993; Cialdini, 2001).

The process of generating compliance refers to the process of getting others to say yes to a request. In other words, compliance is the science of getting what you ask for (Cialdini, 2001; Cialdini & Goldstein 2004). The present article focuses on exactly this topic: compliance evoked by social influence techniques, and the role of the heuristic principle of reciprocity.

Elaboration Likelihood Model

So far, we have introduced some social influence strategies which are used nowadays in many contexts, for example the Door-in-the-Face technique. The question remains how exactly such strategies work to change or influence the behaviour or attitude of the influence target or consumer. Why do people rely on such simple heuristics and get persuaded so easy?

The Elaboration Likelihood Model which was introduced during the 1980s introduced by R.E. Petty and J.T. Cacioppo gives an explanation of how a persuasive message works to change the attitude of the receiver. In particular, the Elaboration Likelihood Model (ELM) assumes that we do not always process communications the same way (Petty & Cacioppo, 1986a).

According to Petty and Cacioppo we make decisions and hence get persuaded through two rather different routes of persuasion, in particular, the central route and the peripheral route. When people think critically about the contents of a message, they are said to take the central route to persuasion and are influenced by the strength and quality of the arguments (Petty & Cacioppo, 1986a). When people do not think critically about the contents of a message but focus instead on other cues, they take the peripheral route to persuasion (Caccioppo, Petty, Kao, & Rodriguez, 1986; Petty & Cacioppo, 1986a; Petty & Caccioppo, 1986b).

On the peripheral route to persuasion, people will often evaluate a communication by using simple heuristics, or rules of thumb (Chaiken, 1987; Chen & Chaiken, 1999). If a communicator has a good reputation, speaks fluently, or looks good, we tend to assume that the message must be correct. Likewise, we assume that a message must be correct if it shows a list of supporting experts or if it is familiar (Shavitt, Swan, Lowrey, & Wanke, 1994).

Certainly, it can be said that not every single message we encounter in our daily life is sufficiently interesting to think about, and not every situation provides us with sufficient time for careful reflection. Every person receives an incredible number of messages daily, and certainly, we do not carefully pay attention to every single one of them. The great majority of these messages are not worth our time and will completely be dismissed. After all, there are only a certain amount of things we can pay attention to, and so we use some rules of thumb, or heuristics, to help us decide whether to accept or reject a message (Chaiken, 1987). These heuristics can be thought of as mental shortcuts we resort to, simply because our time and cognitive capacities are limited (Petty & Wegener, 1999).

It seems that the peripheral route to persuasion is used by consumers when fundraisers make use of social influence strategies, in particular when they make use of heuristics. Remember the example in the beginning? If you would comply with the request and sign the

membership form for the book club, this seems to be akin to the peripheral route to persuasion. This can be explained by the fact that in this context influence targets do not have enough time, lack the ability and motivation to think about the message carefully.

In addition, does the study of automatic responses by Langer et al. (1978) remind you of the peripheral route? To me, it certainly does. This study shows how easily people can be influenced when they are confronted with simple heuristics, in this case a senseless reason, triggered by the word “because”. As a result, the majority of the subjects complied and let the researcher go ahead in line.

A last important point to mention is that the two routes to persuasion do not lead to the same form of attitude change. Attitude change via the central route will be much deeper than via the peripheral route; it is much more resistant to counterpersuasion, it is more long lasting, and predictive of behaviour. Attitude changes via the peripheral route are more superficial, and more easily altered by counterpersuasion.

Limited resource model of self-control and resource-depletion

Thus far, we have described the Elaboration Likelihood Model (ELM) to explain how people get persuaded by a persuasive message. Recently, there is another theory, the limited resource model of self-control, which could possibly explain how and why people get influenced by social influence techniques. Compared to the Elaboration Likelihood Model (ELM) which stresses that people do not always have the motivation and ability to process every single message they encounter, the limited resource model of self-control offers a different explanation of why people so often fall prey to social influence techniques (Baumeister, Schmeichel, & Vohs, 2003).

The self plays a major role in the limited resource model. A reason therefore is that the self is also of crucial importance in social influence techniques. Without the self it would rather be impossible to function in everyday life. The self exerts control over responses about the external world and itself. Beside that, it is responsible for acts of volition, making choices and decisions, and initiating and inhibiting behaviour (Baumeister et al., 2003).

As found out by recent research, active self-control can be detrimental in that it depletes some inner resource, akin to strength or energy (Baumeister et al., 2003; Baumeister & Heatherton, 1996). According to the limited resource model of self-control opportunities for active self-regulation are limited (Baumeister, Bratslavsky, Muraven, & Tice, 1998). The main idea behind resource-depletion is that self-regulatory processes, such as controlled

information processing, cost energy, and this energy provision is limited (Baumeister et al., 1998). This main idea can be compared with the central route of processing.

As stated in the section above, the central route to processing involves thinking carefully about and examining information that is relevant to a particular topic (Petty & Cacioppo, 1986a; Petty & Cacioppo, 1986b). Taking the central route to persuasion seems impossible when we think of the thousand of times each day someone is trying to influence us. It becomes evident that we certainly do not have the time, energy, motivation, and ability to think about every message carefully.

When reviewing the literature, theory in the area of resource depletion draws upon a strength metaphor, whereby exertion in one situation is followed by a period of reduced ability in a subsequent situation (Baumeister, Heatherton, & Tice, 1994; Baumeister & Heatherton, 1996). Accordingly, any exertion of willpower or self-regulation in one task, as long as it is sufficiently demanding, should reduce any subsequent self-regulation on a second, seemingly unrelated task (Baumeister, Muraven, & Tice, 2000; Baumeister et al., 1998). As a consequence, ones resources for self-regulation are reduced and one falls back to routine and automatic behaviour as a basis for decision-making (Baumeister et al., 2000; Baumeister & Vohs, 2007). It appears to be clear that the falling back to routine behaviour plays a role in social influence strategies. Reviewing the study by Langer et al. (1978), subjects actually had no reason to comply but clearly they did because the situation they encountered involved a heuristic (a reason). This and numerous other studies (see for example, Fennis, Janssen, & Vohs, under review; Fennis, Janssen, Pruyn, & Vohs, in press) show that when making use of heuristics, people seem to comply at higher rates.

Notably, studies have lately begun to explore the link between self-regulation failure and persuasion. This area of research suggests that a state of self-regulatory resource depletion weakens resistance to temptations (Baumeister, 2002). For instance, Janssen et al. (in press) linked resource depletion theory to persuasion research, and found that resource depletion has an effect on compliance with a request: in particular compliance increased. This was the case when beforehand a compliance promoting heuristic was present. Specifically, in one of their experiments (experiment 4), a state of regulatory resource depletion was induced with a self-control task and the heuristic principle reciprocity was made salient. The results showed that participants who were depleted complied more as compared to participants in the no-depletion condition. Moreover, participants also complied more when the heuristic principle of reciprocity was made salient. In a different study it was shown that the use of heuristics can also work in the opposite direction, for instance, it can reduce the rate of compliance (Fennis,

Janssen, & Pruyn, 2008). Experiment 3 studied whether a state of resource depletion can result in resistance to persuasion. In order to promote resistance to persuasion, Janssen et al. (2008) used a heuristic which encourages this; a warning about advertisement deceive was used. It was expected that subjects who were warned would have a less positive attitude toward a mobile phone which was recommended beforehand, especially when they were depleted of their regulatory resources. The results supported this pattern.

The present article

When regarding the study of Janssen et al. (2008) the question arises whether resistance to persuasion can be enhanced when different heuristic principles are used. In the recent study we try to investigate whether people who are in a state of regulatory resource depletion comply less with a request when a heuristic is present that promotes resistance to persuasion (reversed reciprocity), in contrast with a condition in which compliance promoting heuristic is present (reciprocity), or no heuristic. This contributes to the literature in that the connection of heuristic reciprocity and resource depletion is used in the reversed direction, which is supposed to promote resistance to persuasion. This in turn extends the literature in that a rather atypical behaviour of consumers will be studied, particularly their resistance. As a consequence the following research question results: Is the effect of resource depletion on the amount of compliance with a request moderated by a heuristic, which either promotes compliance or resistance to persuasion?

We suggest that a state of regulatory resource depletion results in less compliance with a request when a heuristic (in particular reversed reciprocity) is present that promotes resistance to persuasion. Furthermore, we expect that a state of regulatory resource depletion results in more compliance with a request when the heuristic principle of reciprocity is present that promotes persuasion.

When reviewing the literature it becomes apparent that tasks which induce a state of depletion will have a negative effect on the amount of self-regulatory resources.

As a result, the first hypothesis is:

H1: Main effect of depletion induction on amount of self-regulatory resources.

(Subjects have less self-regulatory resources after a depleting task)

Based on the preceding literature, we expect that subjects' compliance rates will differ dependent on how the principle of heuristic will be manipulated.

More specifically, the following hypotheses are:

H2: Main effect of heuristic on the amount of compliance.

H2a: People's compliance is enhanced when the heuristic principle of reciprocity is used.

H2b: People's resistance to compliance is enhanced when the reversed reciprocity principle is used.

The combined effects of hypotheses 1 and 2 may have further implications on the behaviour of subjects. Thus the following hypotheses will also be tested in the present study:

H3: Interaction effect of depletion induction and heuristic activation on compliance.

H3a: A state of self-regulatory resource depletion results in less compliance when a heuristic is present that promotes resistance to persuasion.

H3b: A state of self-regulatory resource depletion results in more compliance when a heuristic is present that enhances persuasion.

Method

Participants

Subjects were 115 students of both sexes at the University of Twente, in Enschede (The Netherlands). Because of extreme scores five subjects were excluded from the study, leaving a total sample of 110 subjects (67 female, 43 male; $M = 21.45$ years old, $SD = 2.91$). In exchange for participating in this study, subjects either received 1 course credit and € 2,50 or € 6,50. Informed written consent was obtained from each participant prior to the study. Subjects were randomly assigned to one of the six conditions with the experimenters blind to condition.

Procedure

Each participant was tested individually in a small room. Prior to arrival at the laboratory, subjects were randomly assigned to one of the six conditions. A 2 (depletion-induction: depletion vs. no depletion) x 3 (heuristic activation: reciprocity vs. reversed reciprocity vs. control) between-subjects design was used in this study.

Upon arrival, participants were told that the experiment consisted of several unrelated tasks which were administered on a computer. Participants' first task included answering the questions of a scale which measures the trait self-control (Tangney, Baumeister, & Boone, 2004). This scale consists of 36 items that are rated on a 5-point scale (1 = not at all; 5 = very much). Sample items include, "I do many things on the spur of the moment", "People would say that I have iron self-discipline" (reversed), and "Sometimes I can't stop myself from doing something, even if I know it's wrong". The reliability of the scale was high ($\alpha = .84$).

Manipulation of Self-Regulatory Resource Depletion. The depletion induction for this study was the Stroop task, a task which is known for challenging people's executive functioning capacities (Baumeister, Ciarocco, & Vohs, 2005). In the Stroop task, which was also done at the computer, research participants were asked to click the colors in which groups of letters are printed. If the letters are random sequences (in this study: XXXXX), this task is rather easy. As a result, this version of the Stroop task was used for the no-depletion condition. If, however, the letters form color names (for example, yellow and red), the task becomes much harder. Thus, a participant might see "red" printed in green ink, "blue" in yellow ink, and so on. The task requires simply to click the name of the ink color, so the participant should click "green, yellow" in the example trials just mentioned. In this setting, the participant cannot help but read the words, and this produces a strong competing response: the subject is likely to respond very slowly, because while trying to click the ink colors, he or

she is fighting the tendency to read the words themselves (Stroop, 1935). As a consequence, this version of the Stroop task is supposed to induce self-regulatory resource depletion by inhibiting the automatic response to read the word. Participants in both conditions responded to 48 items.

State Ego Depletion Scale. Following the Stroop task, the State Ego Depletion Scale (Ciarocco, Twenge, Muraven, & Tice, under review) was presented in order to measure self-regulatory resource depletion. Items included in the scale are, for instance, “I feel exhausted,” “A new challenge would appeal to me right now” (reversed), and “I wish I could relax for a moment”. The reliability of the depletion scale was high ($\alpha=.94$).

Mood. Further, a mood scale of 3 items was presented. The following items were included: “At this moment I feel good/bad,” “At this moment I feel happy/unhappy,” and “At this moment I feel sad/lively”. Once again participants rated these items on a 7-point scale (for example: good 1 2 3 4 5 6 7 bad). The reliability of the mood scale was high ($\alpha = .81$).

Manipulation of heuristic. The next step involved manipulating the salience of the heuristic principle of reciprocity. One of three experimenters (one male, two female) introduced the heuristic principle of reciprocity in an oral manner. In the reciprocity condition, the experimenter entered the room and told participants that he or she would make an excuse and exception from the next part of the experiment, which included a mathematical test (see appendix I), because she or he indicated to have collected enough data on the test. We expected the compliance rates to be higher in this condition because the heuristic principle promotes persuasion. The norm of reciprocity says that we treat others as they have treated us (Gouldner, 1960). In this case, we assume that participants feel obligated to repay the experimenter for his/her act of kindness, of excusing them of the mathematical test. In the reversed reciprocity condition, the experimenter entered the room and told the participant that the experiment was actually over, and all other participants were free after the last task, but he or she would be an exception and had to make a mathematical test because the experimenter needed more data. Further, these participants were told that former participants thought of the test as boring and difficult. In this case, participants were given the feeling that they had already done a lot, but that the experimenter wanted him or her to do an extra task. Based on the norm of reciprocity (Gouldner, 1960) we predicted that participants in the reversed reciprocity condition would comply less as a result of making use of the heuristic principle of reciprocity in the opposite direction. In both conditions (reversed reciprocity and reciprocity) the experimenter entered the room with the mathematical test (see appendix I) in hand and showed the participants what to expect in the test. Participants in the control condition (no

reciprocity principle is used) were not told any information about a mathematical test or anyone being excused from it.

Dependent Measure. Before leaving the room, the experimenter gave participants a standardized form with a request (see appendix II), which asked participants to volunteer some of their free time in order to participate in other studies (see Gorassini & Olson, 1995). The researcher asked participants to read the form and fill it out after the experimenter left the room. In particular the standardized request was as follows:

So much research is going on that there are not enough students on the subject pool to fill the demand. As a consequence, some of our experimenters cannot complete their research because there are too few subjects. The department of Behavioral Sciences is therefore asking students to consider volunteering extra research time in the future -it is an addition to credit time- to help experimenters.

Further, participants were asked for their e-mail address, so that if an experimenter would not have enough subjects he or she might send an e-mail. In addition, participants were asked how much of their free-time they would volunteer to help experimenters. This was used as a measure for compliance (see Kardes, Fennis, Hirt, Tormala, & Bullington, 2007). The alternatives 0 minutes, 30 minutes, 1 hour, 1 ½ hour, 2 hours, 2 ½ hour, and 3 hours. Participants could circle an existing number or write a number in a space next to “other” (amount of time participants would volunteer was an indicator for compliance). Besides that, participants were asked to think of any reasons (independent of their answer) why they would not like to volunteer in research. These counterarguments were included as an extra measure to see whether participants in the resource depletion condition indeed were depleted. We expected that subjects in the depletion condition would name significantly less counterarguments than their non-depleted counterparts. Therefore, the number of counterarguments generated served as an extra measure of self-regulatory resource depletion. An interrater reliability analysis was performed to determine consistency among raters when scoring the counterarguments. The interrater reliability for the two raters was found to be high ($\alpha = .93$).

When the experimenter returned, participants were debriefed and thanked.

Additional measures. Additional items measured how much participants enjoyed the task, how difficult they found the task, whether the task was unpleasant, how much effort they put

into the task, how frustrating the task was, how strong they had to exert control over their self during the task, and how strong they had to control themselves to inhibit a certain inclination. These items were measured on a 7-point scale anchored by 1= not at all (e.g. enjoyable) and 7= very much (e.g. enjoyable).

Results

Manipulation Check

We conducted several manipulation checks to ensure that the instructions the participants became had their intended effects. Given that previous research (for example, Baumeister et al., 1998) has found no mood effects of self-regulation manipulations, we predicted no mood differences as a function of condition. To ensure that our manipulation did not affect mood, we conducted an ANOVA using mood as dependent variable and depletion manipulation as factor. This analysis confirmed our expectations that mood states did not systematically vary with condition, $F(1, 108) = .14, ns$. Further, we tested the manipulation of the Stroop task. Results showed that the Stroop task had a significant effect on time, $F(1, 109) = 32.15, p < .05$. Participants in the depletion induction condition, that is the condition in which participants had to click the color of color words, needed significantly more time to respond to the Stroop-items ($M = 1.23, SD = .36$) compared to participants in the no depletion condition ($M = .92, SD = .19$), who had to click the color of a row of X's. As expected, our manipulation of the Stroop task was effective. Further, participants rated additional items, for example how enjoyable the task was. Results with MANOVA showed that there were no significant effects of depletion induction, $F(1, 109) = .13, ns$, contrary to our expectations. Based on the assumption that the Stroop task involves inhibiting the automatic response to read the words (Stroop, 1935), we anticipated to find a significant effect on the following items: "I had to exert control over myself during the task" and "I strongly had to control myself to inhibit a certain inclination". Specifically, participants in the depletion condition and in the no depletion condition responded similar to these items (for example, depletion condition: $M_{\text{exert control over myself}} = 4.11, SD = 1.59$; no depletion condition: $M_{\text{exert control over myself}} = 4.13, SD = 1.57$).

Analyses of hypotheses

Overall, 76.4% of the participants complied with the request to act as a volunteer. Our first prediction was that there would be a main effect of depletion induction on the amount of self-regulatory resources (H1). The State Ego Depletion Scale (Ciarocco et al., under review) was presented in order to measure self-regulatory resource depletion and we expected that individuals in the depletion condition would have significantly higher scores compared to participants in the no depletion condition. We used a univariate analysis to examine the data. The State Ego Depletion Scale served as the dependent variable and the depletion induction was the fixed factor. This analysis revealed no significant effect, $F(1,108) = .04, p = .85$.

When examining the scores it can be observed that the means were almost the same for subjects in the depletion condition ($M = 3.56, SD = .81$) and for subjects in the no depletion condition ($M = 3.59, SD = 1.17$). In addition, we predicted that subjects in the depletion condition would name significantly less counterarguments than their non-depleted counterparts. Therefore, we looked at the number of counterarguments as a measure of self-regulatory resource depletion. Again, we used a univariate analysis. A significant main effect was observed when counterarguments served as the dependent variable, $F(1, 108) = 6.80, p < .05$. Specifically, this result showed that participants who were depleted of their regulatory resources generated overall less counterarguments ($M = .87, SD = .73$) as compared to participants in the no depletion condition ($M = 1.30, SD = .99$).

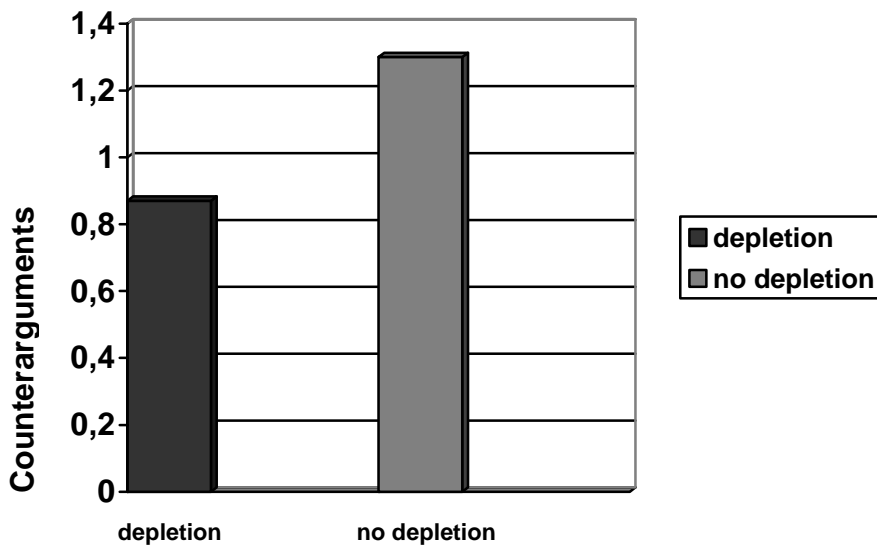


Figure 1. Amount of counterarguments as a function of depletion induction.

In contrast to hypothesis 2 we found no main effect of heuristic on the amount of compliance, when the amount of time one was willing to volunteer in future research served as the dependent variable, $F(1, 107) = 1.24, p = .29$. However, a trend can be seen in the expected direction. In particular, participants complied more with the request when the heuristic principle of reciprocity was made salient ($M = 46.11, SD = 35.15$) compared to compliance rates in the no-reciprocity condition ($M = 43.78, SD = 32.86$) and compared to the reversed reciprocity condition ($M = 34.86, SD = 28.73$).

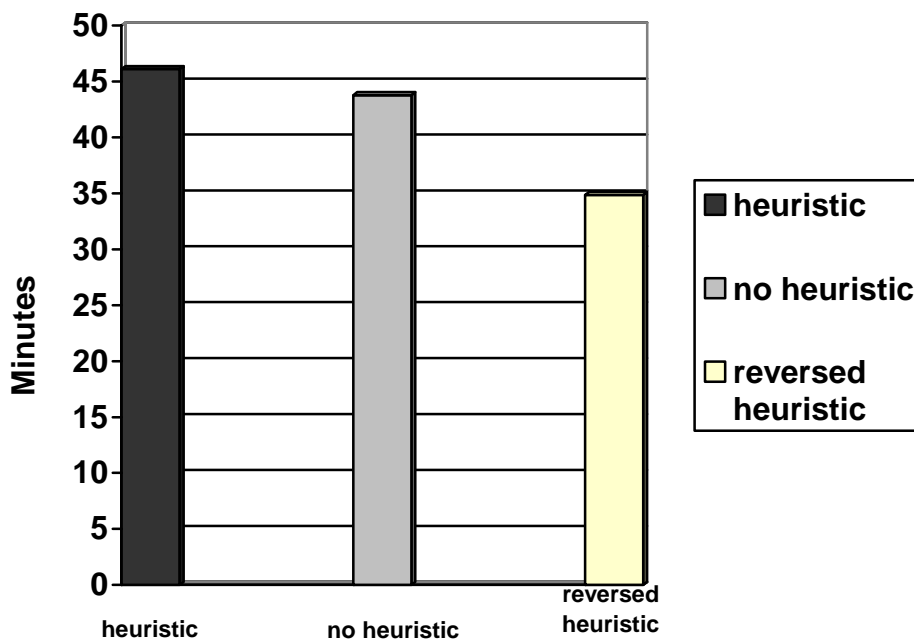


Figure 2. Amount of time one is willing to volunteer as a function of heuristic-activation

To test for hypothesis 3 we conducted a univariate analysis on the degree of compliance with the request as a function of depletion condition (depletion vs. no-depletion) and heuristic-activation (reciprocity vs. reversed reciprocity vs. control). The ANOVA with compliance as dependent variable and heuristic activation and depletion as fixed factors produced no significant results. That is, neither the main effect of depletion induction, $F(1, 104) = 1.61, p = .21$, nor their interaction, $F(1, 104) = .29, p = .75$ was significant. As a consequence, the results indicate that the heuristic principle of reciprocity apparently does not have a moderating role in the effect of depletion on compliance.

General Discussion

This study is concerned with the effect of resource depletion on persuasion. Specifically, we predicted that, when people are in a state of regulatory resource depletion, this will lead to less compliance with a request when the reversed heuristic principle of reciprocity is present that promotes resistance to persuasion. Furthermore, we also expected that a state of regulatory resource depletion results in more compliance with a request when the heuristic principle of reciprocity is present that promotes persuasion. In the end, not all hypotheses are confirmed. Reasons for the effects found and results will be discussed in the following section.

By and large, the results of the present study provide support for a resource model of self-regulation. We expected that subjects would have less self-regulatory resources after a depleting task. Specifically, we used the Stroop task to manipulate self-regulatory resource depletion. Contrary to our expectations, participants in the depletion condition did not score higher on the State Ego Depletion Scale, than participants in the no-depletion condition. One possible explanation for this finding might be that most of the subjects who participated in this experiment were psychology students, who surely are familiar with the Stroop task. Further, it could be that participants were not aware and did not realize that the task involves inhibiting a strong automatic response. These reasons might explain why we found insignificant results on the State Ego Depletion Scale. Another explanation could be that, when participants had to *name* the colors instead of *clicking* the words this might have been more challenging and might have lead to different results. A different possible explanation could be that the State Ego Depletion Scale was not the right manner to measure depletion. This might be because the State Ego Depletion Scale is a subjective measure that is filled out by participants on their own, and therefore might be less reliable. Moreover, participants had to answer additional items, for example, how much participants enjoyed the task. With regard to two items we anticipated to find significant differences in the depletion condition compared to the no depletion condition. Specially, the two items were about how strong participants had to control themselves to inhibit a certain inclination and whether subjects had to exert control over themselves during the task. These items did not show the desired effect, which might again be due to the fact that the subjects were already familiar with the Stroop task. Another reason may be that the items were not interpreted the way intended. It might have been the case that some participants did not relate these items to the Stroop task but to other tasks which they did beforehand. On the other hand it has to be said that there are a several studies which also used the Stroop task to manipulate self-regulatory resource depletion (see for

example, Baumeister et al., 2005) where a significant effect was indeed found. Thus, the results from this study are somewhat unusual.

In line with our first hypothesis, we found a significant effect of self-regulation on the amount of counterarguments. Particularly, subjects in the depletion condition mentioned significantly less counterarguments for why they would not like to volunteer as research participants compared to participants in the no depletion condition. This result provides evidence that self-regulatory resource depletion in one domain has an effect in other areas. Moreover, this finding is consistent with our argument that people will have less self-regulatory resources after they were confronted with a depleting task. Additionally, this result supports the findings reported by Janssen et al. (in press) that a state of resource-depletion has an impact on the amount of self-regulatory resources.

The second hypothesis, that people's compliance will be dependent on the salience of a heuristic principle, did not reach significance. Nonetheless, a trend can be seen in the desired direction. That is, participants were overall willing to spend more minutes voluntarily participating to help experimenters when the heuristic principle of reciprocity was made salient compared to when the reversed principle of reciprocity was used and when no reciprocity was used. One reason might be that participants who were in the reversed reciprocity condition did not get the intended and desired feeling that they had to do some extra task because they were just told that they had to do the algebra exercises but did not actually get them. If we would have really let these participants make the exercises and would have asked them afterwards to help voluntarily participating, this might have led to different results. Furthermore, these insignificant results may be due to the fact that compliance promoting principles, such as reciprocity, are usually used in real life contexts. Take for example the Door-in-the-Face technique (Cialdini, 2001). This technique is frequently used in soliciting blood donors (see for example, Cialdini & Ascani, 1976). Results of this study indicated that those who donated blood due to the Door-in-the-Face technique complied significantly more compared to a control condition. The question remains whether the same results would be found when the study was done in a laboratory. This might be an issue for future research. When reviewing the example mentioned in the beginning where a young and friendly man tries to persuade you to sign a membership form in order to become a member of a book club, do you think you would agree to this request when it was made in a lab? Or do you think that the chance that you would comply would be greater in a real-life context? Future research should examine whether the effects of different social influence strategies can also be found in a lab setting. Somehow contrary to these explanations, Janssen et al. (in

press) also used the reciprocity principle in a laboratory in one of their experiments (experiment 4) and found significant results. Generally, it should be said that if an effect appears only once, the proper approach is to further investigate the conditions that determine when the effects occurs, not to reject the effects. Thus, future research should examine these effects and might find alternate explanations.

The last hypothesis is about the interaction between depletion induction and heuristic activation on the amount of compliance. This effect failed to reach significance. An explanation might be that resistance to persuasion is found to be strongly affected by motivation (Muraven & Slessareva, 2003) and resource-depletion is most likely to lead to reductions in resistance when motivation to resist is present. In the present study, motivation to resist might not have been present in the view of the participants. Specifically, subjects were given the feeling that they had to do an extra task, reversed principle of reciprocity was made salient, which was expected to result in less compliance. As already mentioned, we did find a trend in the predicted direction.

Janssen et al. (2008) have shown that a state of regulatory resource depletion can result in resistance to persuasion when a warning about advertisement deceive was used. That is, participants who had been warned had a less positive attitude toward a mobile phone that was advertised beforehand, compared to participants who had not been warned. The discrepancy between the present study and the Janssen et al. (2008) study may be due to the fact that we used another heuristic principle, in particular reversed reciprocity. An interesting topic for future research would be to examine different heuristic principles in order to find out if there are specific heuristics which have a stronger effect on resistance to persuasion than others. Moreover, future research will be necessary to examine how the extent of resource-depletion interacts with heuristic-activation to affect resistance to persuasion. For instance, the contexts and circumstances should be studied in which resistance to persuasion will be enhanced or reduced. Another explanation for the insignificant results might be that larger sample sizes will be necessary to detect significant results.

In addition, a study by Meyers-Levy and Zhu (2007) has shown that ceiling height can encourage alternate types of elaboration. Specifically, the results showed that the concepts primed by a high ceiling can induce relational processing, and concepts primed by low ceiling height item-specific processing. The effects of ceiling height were not included in the present study. But it might have been that ceiling height had an effect on the compliance rates. For instance, the effect of ceiling heights might also have an effect on the two routes to persuasion, the peripheral route and the central route. It might be possible that different

ceiling heights promote these two types of processing, which in turn might have different effects on compliance rates and how consumers process influence attempts. The link between ceiling height and compliance strategies is an unstudied area of research. It would be appealing to study this interaction in future research.

Finally, what do the results mean for us as consumers or as influence targets? Apparently, we do not have the resources, the time, the motivation, and the ability to process every single message we encounter in our daily lives when someone is trying to persuade us. The present article has shown that we are often not even aware of many influence attempts (for example, Langer et al., 1978). As a consumer and influence target it is crucial to be cautious as soon as we are in a social influence situation. Especially, when influence agents make use of clever influence techniques we should think twice before we sign a petition, donate money, and so on. Remember again the example from the beginning. If you would be aware that someone is trying to persuade you to sign a membership form of a book club, do you think the chance that you would comply would be the same when you were not aware of the fact that you are in a social influence situation? Surely, the correct answer is no.

But what do the results of the present study mean for influence agents? Obviously, when we want to persuade someone we likely have more success when the resources of a person are depleted. This is shown by the decrease in amount of counterarguments subjects had after they were depleted, compared to when they are not depleted and when the context makes use of a strong heuristic which is made salient (see for example, Janssen et al., in press).

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Appendix I

Example of exercises from the mathematical test

1. Ontbind zo ver mogelijk in factoren:

(a) $x^3y - 15x^2y + 26xy$ (b) $()^2()^2 2x - 1 - x - 2$ (c) $y^3 \cdot 2y - y \cdot 2y + 2$

2. Gegeven is de functie: $f(x) = x(5 - x)$

(a) Bereken $f(4)$ en $f'(4)$.

(b) Benader met behulp van uw uitkomsten bij a de verandering van de functiewaarde indien x vanuit 4 met 0,02 afneemt.

(c) Stel de vergelijking op van de raaklijn aan de grafiek van f in het punt waar $x=4$.

3. De kostenfunctie voor een producent is: $K(q) = 200q + 15$ met $q > 0$

De hoeveelheid q van een artikel is een functie van de prijs p volgens de formule:

$$q = 100 - 0,2p \text{ met } p > 0 \text{ en } q > 0$$

(a) Schrijf de winstfunctie W ('opbrengst' - 'kosten') als een functie van de hoeveelheid q .

(b) Bereken bij welke combinatie van prijs en hoeveelheid de winst maximaal is.

4. Gegeven driehoek ABC.

Hoek B is een rechte hoek

Bij D zie je twee rechte hoeken.

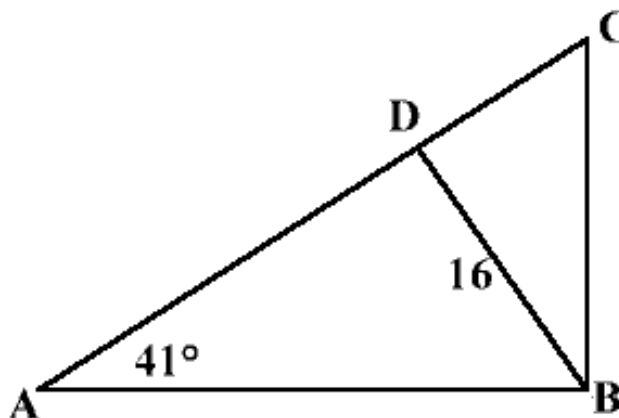
$$BD = 16 \text{ en } \angle A = 41^\circ.$$

a. Bereken AB

b. Bereken AD

c. Bereken BC

d. Bereken DC



Appendix II

Faculteit Gedragwetenschappen

Marketingcommunicatie en Consumentenpsychologie

Beste student,

Er wordt momenteel een groot aantal onderzoeken afgenomen binnen de faculteit Gedragwetenschappen en dit aantal blijft toenemen, waardoor de pool van proefpersonen bijna niet meer toereikend is. Als gevolg hiervan kunnen studenten vaak niet op tijd hun afstudeeronderzoek afronden, omdat er te weinig mensen aan het onderzoek deelnemen. De faculteit GW wil daarom vragen of je eventueel bereid bent om ook zonder daarvoor proefpersooncredits of geld te ontvangen aan toekomstige onderzoeken deel te nemen, om onze onderzoekers een handje te helpen.

Mogen we jou hiervoor benaderen als dit nodig mocht zijn, en hoeveel tijd zou je in dat geval bereid zijn om vrijwillig aan onderzoek deel te nemen?

E-mail: _____

- 0 min.
- 30 min.
- 1 uur
- 1½ uur
- 2 uur
- 2½ uur
- 3 uur
- anders, namelijk: _____

Zou je hieronder (onafhankelijk van je antwoord) aan willen geven wat je bezwaren hiertegen zouden kunnen zijn:
