A study examining the relationship between willpower beliefs and help-seeking behaviour, and the moderating role of friendliness

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Abstract

Previous studies show that whether one's self-control is depleted, depends on their implicit beliefs about willpower as either a limited or an unlimited resource. Literature suggests that unlimited willpower beliefs not only have beneficial effects, since it could lead to less help-seeking. Therefore, the current study examined the effect of willpower beliefs on help-seeking behaviour. Additionally, the moderating role of friendliness of the potential help-giver was examined, to investigate whether social proximity compensates for a lack of self-control. Participants performed a taxing task and were led to believe that they were depleted or not (by manipulating their willpower beliefs). Subsequently, they worked on a puzzle for which they could ask for a hint from the experimenter, who was either friendly or unfriendly. No effects of willpower beliefs and friendliness on help-seeking were found, which may be due to a failed willpower belief manipulation. To gain a better understanding of the effect of willpower beliefs on help-seeking and its underlying mechanism, concrete suggestions for future research are given.

Eating healthy, waking up early and concentrating on your work: examples of intentions that most people struggle to live up to (Baumeister & Heatherthon, 1996). To achieve one's long-term goals, individuals have to resist daily life temptations such as a chocolate bar at the cash register, snoozing for another five minutes, and incoming messages on their phone. It is often believed that resisting those temptations requires self-control (Muraven & Baumeister, 2000). A lack of self-control can lead to decisions which are disadvantageous in the long-term (Baumeister, Vohs &, Tice, 2007). For instance, addiction, obesity, racism, and poor academic achievement are examples of behavioural outcomes which were for a long time considered as caused by failures of self-control (which is often referred to as willpower; Carter, Kofler, Forster, & McCullough, 2015; Muraven, Gagné, & Rosman, 2008; Christiansen, Cole, & Field, 2012).

Self-control and willpower beliefs

Self-control is defined as "the capacity to consciously shape one's behaviour and to bring it in line with social standards or long-term goals" (Bernecker & Job, 2017, p. 157). The *strength model of self-control* suggests that self-control is limited; and thus, fails when it is depleted, or demands are high (Baumeister, Bratslavsky, Muraven, & Tice, 1998). Therefore, acts of self-control in one sphere following previous acts of self-control in another sphere will be less successful (the *depletion effect*; Baumeister et al., 1998). For example, resisting the temptation to eat chocolate and cookies caused people to give up faster when solving difficult problems (Baumeister et al., 1998), which illustrates the *depletion effect*.

However, the meta-analysis of Carter and colleagues (2015) indicated that there might be insubstantial evidence for the *depletion effect*. For instance, Muraven & Slessareva (2003) showed that when people were motivated by an incentive to resist temptations, they did not show depletion effects per se. Therefore, more recent research is focused on people's implicit theories about their self-control predicting their actual self-control, also referred to as willpower beliefs (Job, Dweck, & Walton, 2010; Job, Walton, Bernecker &, Dweck, 2015; Vohs, Baumeister &, Schmeichel, 2012). In these studies, individuals either perceive their self-control as a limited resource which is easily depleted or as an unlimited resource which can even be self-generating (Job et al., 2015). Job and colleagues (2010) found that only people who thought of (or who were led to think of) willpower as a limited resource showed depletion effects. For people who had (or were led to adopt) an unlimited willpower belief, a demanding task did not impair subsequent performance. In one experiment, the demanding task actually improved their subsequent

performance. Job and colleagues (2010) showed that people with limited willpower beliefs turned out to have poorer self-regulation in everyday life when demands were high. These results suggest that reduced self-control after a depleting task may reflect people's beliefs about their willpower rather than true resource depletion, which is illustrated by several studies (Job et al., 2015; Bernecker & Job, 2017). Students who endorsed the limited theory and faced high demands over term, procrastinated more, ate more junk food, and reported more excessive spending compared to students postulating an unlimited theory about willpower (Job et al., 2015). In accordance with this, several studies demonstrate that endorsing an unlimited willpower theory promotes academic performance and psychological functioning during challenging conditions, such as in difficult educational contexts (Job et al., 2015; Job et al., 2010). The studies mentioned above seem to indicate that endorsing unlimited willpower beliefs only has beneficial effects.

Social Baseline Theory

However, theoretical and empirical literature suggest that when one endorses unlimited willpower beliefs, one will resort to seeking help less easily, which is a negative effect (Newman, 2011). This effect could be explained by the underlying mechanism of how we deal with the perception that our self-control is depleted. The *strength model of self-control* states that after exertion of self-control, one must rest to get the resource refuelled again (Baumeister et al., 1998). Nevertheless, research suggest that there are various methods to refuel your resources. For instance, the Social Baseline Theory (SBT) states that social proximity can compensate for the loss of personal resources (Beckes & Coan, 2011), since humans utilise each other as their own resources (Coan & Maresh, 2014). In other words, when an individual thinks he or she is depleted, proximity of another person could compensate for the lack of self-control. This could mean that the perception that one is depleted, will make the individual approach others. This could be explained by more than a million years of human evolution. Namely, humans have developed an instinct to assume that we will be supported by the people around us. We are not adapted to any terrain, diet or climate – such as animals – but rather to each other. We are defined by the ability to cooperate with others (Richerson, Bettinger, & Boyd, 2005 in Coan & Maresh, 2014). Therefore, humans are used to function within a network of social relationships characterised by familiarity, shared intentionality and interdependence (Tomasello, Carpenter, Call, Behne, & Moll, 2005). Distance from relational partners increases demand on personal

resources and is therefore a risk for humans (Coan & Maresh, 2014), which is illustrated by several studies. When a relational partner is nearby, physical pain is perceived as less intense, (Brown, Sheffield, Leary, & Robinson, 2003), infant cries were perceived as conveying less distress (Harber, Jussim, Kennedy, Freyberg, & Baum, 2008), and hills appear to be less steep (Schnall, Harber, Stefanucci, & Proffitt, 2008). The perception of threat decreases as a function of not only proximity to social resources but also the perceived quality of those resources, such as feeling close to the support source, higher relationship quality, intimacy, and higher perceived mutuality (Coan, Schaefer, & Davidson, 2006; Coan, Kasle, Jackson, Schaefer, & Davidson, 2013). Current study is focussed on friendliness, since this is an important determinant of the perceived quality of the relationship (Shamdasani & Balakrishnan 2000).

The results of the studies mentioned above elicit the following questions: If we have the feeling that our self-control is infinite, and it cannot get depleted, and thus endorse an unlimited willpower belief, does that mean that we are less likely to use others' resources and thus ask for help later? And does friendliness of the potential help-giver influence this effect? An initial study provides suggestive evidence for the former idea (Hendriks, Konings &, Bosman, 2017). In this experiment, participants had to solve a puzzle of which they did not know that it was unsolvable. They were told that they could ask for a hint if they needed it. They found that participants who were led to think of willpower as an unlimited resource, asked for help less easily than participants who adopted limited willpower beliefs. This is unfortunate, since an important aspect of the learning process is asking questions about things one does not understand (Newman, 2002).

Help seeking behaviour

Help-seeking contributes to students' learning ability and can lead to the aversion of possible failure and increases the likelihood of long-term mastery and autonomous learning (Newman, 2002). Avoiding to seek help is a common habit for many people, which is unfortunate since this could impair task performance and thus is detrimental to personal and academic development (Chou et al., 2018; Newman, 2002). For instance, instead of taking the initiative to obtain needed help, students often sit passively, waiting for the teacher to come to them (Newman, 2002; Good, Slavings, Harel, & Emerson, 1987). Seeking help involves a threat to the person's self-esteem, since those who asks for help may experience this as an admission of his or her own failure and inadequacy (Depaulo & Fisher, 1980; Morris & Rosen, 1973). Much

research has sought to examine the factors influencing help-seeking behaviour. For instance, a positive social relationship between the help-seeker and the potential help-giver increases the likelihood that a student will ask someone for help (Marchand & Skinner, 2007; Newman & Schwager, 1993).

Current study

The above mentioned theoretical and empirical research suggest that it is important to gain insight in the effect of willpower beliefs on help-seeking behaviour. Although Hendriks and colleagues (2017) found suggestive evidence that endorsing unlimited willpower beliefs go hand in hand with less help-seeking, it is not yet clear if this effect is robust and if so, which mechanism it underlies. Do people unconsciously perceive asking others for help as a compensation of loss of their own resources? According to the SBT this is particularly the case when the perceived quality of the relationship is high, and thus, the potential help-giver is perceived as friendly. Therefore, the aim of the current study is to see whether friendliness of the potential help-giver influences the effect of willpower beliefs on help-seeking behaviour. The hypothesis is that people who endorse limited willpower beliefs are more likely to ask for help, especially when the potential help-giver is friendly. The aim of the current study is to gain more insight into this hypothesis, and thus, explore the potential disadvantageous consequences of unlimited willpower beliefs. The insights of this study may be useful for educational purposes, since help-seeking behaviour influences the learning process of students.

Method

Participants and design

58 participants (six males; 18-26 years of age ($M = 21.43$, $SD = 1.87$) participated in the experiment. Eventually, 54 participants were included in the analysis. Inclusion criteria were age (18-65 years old), language (Dutch), unfamiliarity (unknown to the experimenter) and being of the same sex as the experimenter. The latter two inclusion criteria were set because familiarity and being of the opposite sex both could interfere with help-seeking behaviour (Nadler, Shapira, & Ben-Itzhak, 1982; Coan & Maresh, 2011).

Participants were either recruited online (via social media) or at the Utrecht University (UU) campus (using posters and flyers). The participants were compensated for their efforts when they completed participation in the experiment. Three Bol.com gift cards each worth ten

euros were distributed over the participants who were willing to participate in the lottery. Psychology students from UU were rewarded with one participant credit (for 45 minutes).

Prior to the data collection, the required sample size for the current study was determined. Two power calculations were performed, with a desired power = 0.8 and α = .05 (one-tailed) (G*Power, version 3.1.9.2; Faul, Erdfelder, Buchner, & Lang, 2009). The first power analysis is based on previous research on the effect of willpower beliefs on e.g., delay of gratification and mental fatigue (Clarkson, Otto, Hirt, & Egan, 2016; Vohs et al., 2012). Based on these studies, 24 participants per between-subjects condition are needed to detect the same, medium effects. To supplement this power analysis, a power analysis based on a previous study in which the effect of confederate friendliness was tested on action coordination was done as well (Hommel, Colzato &, Wildeberg, 2009). A total sample size of $N = 10$ would be sufficient to detect the same, medium effect. The minimal total sample size in this study is based on the largest minimum sample size per between-subjects condition. To account for potential missing data, 10% extra participants per between-subjects condition were tested. Therefore, in present study the minimal total sample size is $N = 53$ (2 x 24 + 10%).

The study has a 2 (willpower beliefs; unlimited versus limited) x 2 (friendliness of the experimenter; friendly versus unfriendly) between-subjects design in which time before asking for help (in seconds) during the unsolvable puzzle serves as the dependent variable.

Materials and procedure

During the whole experiment, half of the participants were confronted with a friendly acting experimenter, and the other half was confronted with an unfriendly acting experimenter. The 'friendly' experimenter acted politely, smiled, and behaved in a calm and reassuring way. The 'unfriendly' experimenter did not smile, was authoritarian, and behaved in a tense manner (cf., Hommel et al., 2009). A script was used to ensure that the different experimenters communicated in the same (un)friendly way towards the participants (see Appendix 1).

First, the experimenter verbally explained the informed consent to increase the possibility to act either friendly or unfriendly. Secondly, participants were asked to read and sign the informed consent form (see Appendix 2). Subsequently, participants completed a Stroop task which depleted their self-control. The Stroop task is a commonly used and reliable task to tax participants' self-control (Dang, 2017). Participants had to indicate the font colour (red, green, blue, or yellow) of different colour words (RED, GREEN, BLUE, or YELLOW) which requires

self-control when the font and meaning are incongruent (e.g., RED in blue font), since one must inhibit automatically activated word representations (MacLeod, 1991). For this task, participants had to press the 'E' on the keyboard when the font colour was green, 'F' when it was red, 'I' when it was blue, and 'J' when the font colour was yellow.[1]

Next, participants read a text which was meant to manipulate their willpower beliefs (see Appendix 3). Half of the participants read a text which supported the belief that willpower is limited. These participants were tried to convince that self-control is similar as a muscle which needs rest after willpower exertion. The other half of the participants read a text telling them willpower is unlimited. In this way, they were tried to convince that they did not need rest after exertion and self-control can even be self-generating. They were told that after they read the text, they had to answer a related question. Namely, they were asked to summarise the text to strengthen the manipulation and to ensure awareness of the information.

Subsequently, help-seeking behaviour was measured. Participants had to solve a puzzle of which they did not know it is unsolvable (see Appendix 4). It was instructed verbally as well as written that they needed to finish the puzzle as fast as possible and if they needed a hint, they could ask the experimenter. The participants were told that the influence of individual differences on cognition was measured. To measure help-seeking behaviour, the experimenter kept track of how much time (in seconds) passed after starting the puzzle task and before asking for a hint. After participants asked for help, the experimenter told them that the puzzle was unsolvable and therefore, they could stop trying to solve it. Beforehand, nothing was said about the time in which the participant had to solve the puzzle. The experimenter told the participants to stop after 15 minutes, since it would be unethical to let participants try to solve the puzzle for an infinite period. After 13 minutes, the experimenter told them they only had two minutes left to solve the puzzle, to give the participant the opportunity to ask for help within the 15 minutes.

Lastly, the experimenter left the room to reduce the chance of socially desirable answers on the last questionnaire. This questionnaire consisted of the Brief Self-Control Scale (BSCS; Tangney et al., 2004) and the Theories of Willpower Scale (TWS; Job et al., 2010). Also, to

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[1] In the current study, the Stroop task consisted of 180 trials (excluding the first 8 practice trials), with 72 congruent trials and 108 incongruent trials. Each trial consisted of a black screen which lasted 995 milliseconds (ms). Then, a white fixation dot in the centre of the screen appeared, lasting 195 ms, followed by another black screen, which also lasted 195 ms. Subsequently, the word appeared, and participants had to press the corresponding key. If they pressed the right key, the next trial followed. 'Too slow' (te langzaam!) appeared for 300 ms if no key was pressed after 1200 ms. When participants pressed the wrong key, a white cross appeared that that lasted 300 ms.

check whether the manipulation of friendliness of the experimenter succeeded, the question "How friendly did you find the experimenter?" with a 5-point Likert scale was asked. Finally, the questionnaire finished with two questions regarding the age and sex of the participant.

The BSCS tests the overall self-control of the participants (see Appendix 5) and therefore, functioned as a randomisation check. It consists of 13 items (e.g., "I am good at resisting temptation" and "People would say that I have a strong self-discipline"), each with a 5-point Likert scale ranging from 1 (not applicable to me at all) to 5 (very much applicable to me). The Cronbach's alpha of .879 showed that the scale is reliable

The TWS served as a manipulation check. The outcome of the TWS (hereafter referred to as TWS-score) showed whether the participants were convinced of the text they read about willpower beliefs (see Appendix 6). The scale consists of 12 items (e.g. "Your mental stamina fuels itself" and "Resisting temptations makes you feel more vulnerable to the next temptations that come along"), each with a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). The higher the TWS-score, the more someone adopted the limited willpower belief. The reliability of the questionnaire was good, Cronbach's alpha = .801.

After completing the questionnaire, participants could choose their compensation for participating in the experiment and, if they were interested in the results of the study, leave their email address. The experiment ended with a verbal debriefing (see Appendix 1).

Results

IBM SPSS Statistics 25 was used in order to analyse the data. All analyses were performed with a significance level of $\alpha = .05$. Before the data-analysis, four participants were excluded because of their knowledge about the puzzle being unsolvable. Also, one case was deleted because of missing data about the time before asking for help. Four participants in the unlimited willpower belief condition did not ask for help during the 15 minutes. During the analysis, these cases were treated as if they asked for help after 15 minutes.

Manipulation and randomisation checks

First, a *MANOVA* was performed as a randomisation check to see whether gender, age, and self-control were evenly distributed between the four groups. No differences were found for gender and age between the groups. Only the average score of the BSCS (hereafter referred to as self-control) was not evenly distributed between the two friendliness groups, $F(1,54) = 4.65$, $p =$

.036, $\eta^2 = .085$, such that self-control was higher in the friendly condition ($M = 3.14$, $SD = 0.84$) compared to the unfriendly condition ($M = 2.74$, $SD = 0.46$). Therefore, self-control will be included as a covariate in the main analysis.

Next, two independent samples t-tests were performed to check whether the manipulations had the desired effect. The manipulated friendliness of the experimenter succeeded, since the participants in the unfriendly condition rated the experimenter as less friendly ($M = 3.54$, $SD = 1.04$) than participants in the friendly condition ($M = 4.76$, $SD = 0.50$), t (37.60) = 5.49, $p < .05$, $d = 0.15$. The willpower belief manipulation did not have its expected effect. There was no significant difference in TWS-score between the participants in the limited willpower belief condition and the unlimited willpower belief condition ($M = 3.80$, $SD = 0.70$ and $M = 3.74$, $SD = 0.52$ respectively), t (52) = 0.37, $p = .714$.

Main analysis

A final two-way *ANCOVA* was conducted with time before help as dependent variable, willpower beliefs and friendliness as independent variables and self-control as covariate to compare the main effects of willpower beliefs and friendliness and the interaction effect between willpower beliefs and friendliness on time before asking for help. Beforehand, Shapiro-Wilk and Levene's tests showed that the assumptions for both normality and homogeneity of variance were met. Also, there was homogeneity of regression slopes.

Descriptive statistics suggested that time before asking for help was higher for the participants manipulated with unlimited willpower beliefs ($M = 503.59$, $SD = 251.58$) compared to participants manipulated with limited willpower beliefs ($M = 429.00$, $SD = 210.79$; Figure 1). Moreover, participants who were treated friendly, seemed to ask for help later compared to participants who were treated unfriendly (respectively $M = 494.93$, $SD = 243.86$ and $M = 437.67$, $SD = 222.37$; Figure 1). However, the two-way *ANCOVA* revealed that there were no main effects of willpower beliefs and friendliness of the potential help-giver on time before asking for help, F (1,47) = 0.54, $p = .468$, $\eta^2 = .011$ and F (1,47) = 1.57, $p = .216$, $\eta^2 = .032$ respectively. The interaction effect for willpower beliefs and friendliness of the potential help-giver yielded an F ratio of F (1,47) = 0.43, $p = .518$, $\eta^2 = .009$, indicating that the effect for friendliness of the potential help-giver was not significant either. Thus, although the descriptive statistics seem to indicate that there are differences between the groups, these are not statistically significant.
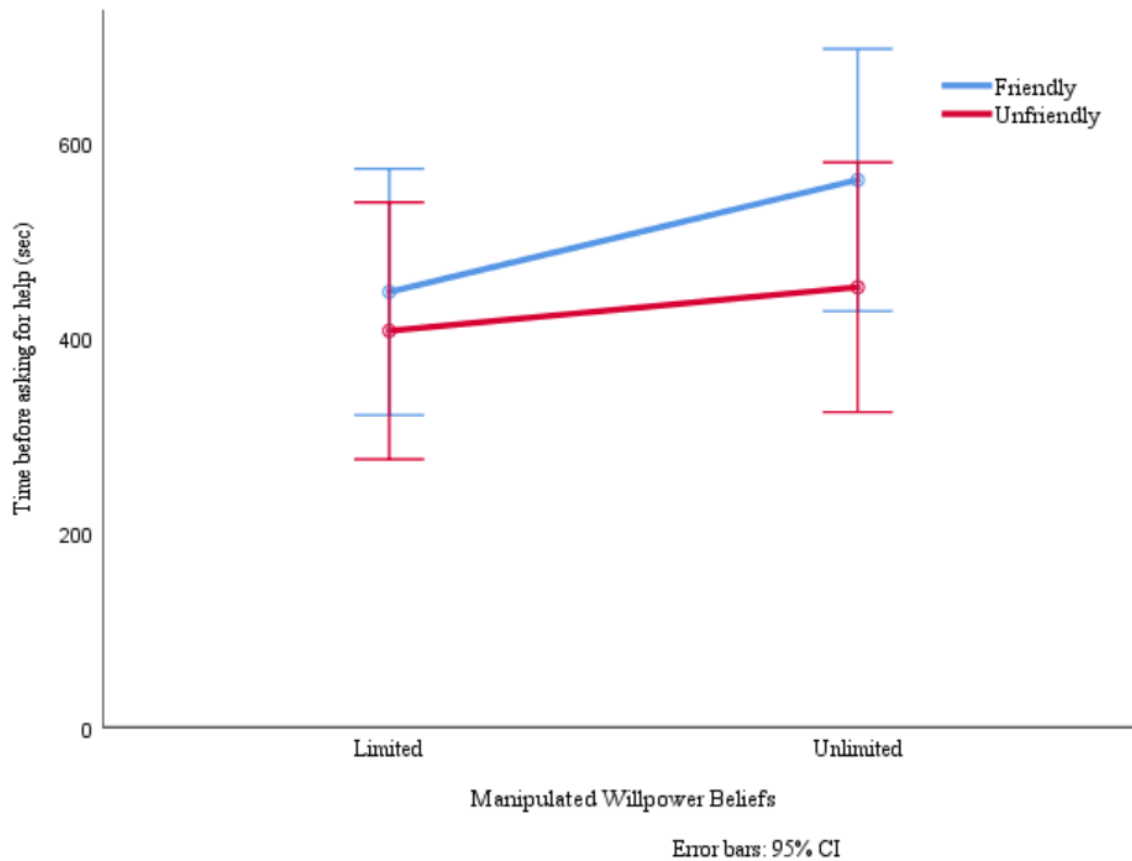
Figure 1. Time Before Participants Asked for Help (in sec.), Dependent of their Willpower Beliefs (x-axis) and Friendliness of the Potential Help Giver (separate lines).

Exploratory analysis

As mentioned before, the willpower belief manipulation did not have its desired effect on the actual willpower beliefs of the participants. Therefore, an exploratory analysis was performed, in which the TWS-score served as independent variable, instead of the actual willpower belief condition. A regression analysis performed by the SPSS PROCESS-plug in (Hayes, 2012) was executed. However, as in the main analysis, no significant main- or interactions effects were found, with $p = .537$ as the smallest p-value.

Discussion

The present study aimed to replicate and extend previous findings (Hendriks et al., 2017) concerning the influence of willpower beliefs on help-seeking behaviour and the mechanism underlying this effect. Specifically, the aim of the current study was to investigate the effects of willpower beliefs on help-seeking behaviour and the role of friendliness of the potential help-

giver. The results did not confirm the expectation that people who endorse limited willpower beliefs are more likely to ask for help compared to people who believe willpower is unlimited. Also, based on the SBT (Beckes & Coan, 2011), it was expected that when the potential help-giver is friendly, the effect of willpower beliefs on help-seeking behaviour is even stronger. Against this expectation, friendliness of the potential help-giver did not make a difference. Important to note is that the willpower belief manipulation failed. Nevertheless, the self-reported willpower beliefs did not indicate that willpower beliefs, friendliness of the potential help-giver and help-seeking were related either. Thus, based on these results, it cannot be stated that people unconsciously perceive asking for help as a compensation of loss of their own resources, which was suggested by the SBT (Beckes & Coan, 2011).

Although there were no statistically significant differences between the groups, there was one aspect in the results that stood out. Despite that the participants who were either treated friendly or unfriendly did not differ in their help-seeking behaviour, it is remarkable that the results slightly suggested that the participants who were treated unfriendly, seemed to be more likely to ask for help compared to participants who were treated friendly. This is interesting, since this is contradictory with what empirical and theoretical literature suggests (Beckes & Coan, 2011). A possible explanation is that an unfriendly treatment induced an uncomfortable feeling and subsequently, they might have wanted to get rid of the unfriendly experimenter as quickly as possible by leaving the room. It may be that an uncomfortable feeling outweighs the effects of social proximity as a compensation of a lack of personal resources. Consequently, unfriendly treated participants would ask for help sooner. However, important to note here is that this does not necessarily mean that an unfriendly treatment of students by teachers stimulates help-seeking behaviour, since in natural contexts, students could get rid of an uncomfortable feeling induced by an unfriendly treatment by just avoiding the teacher, and thus avoid seeking help, instead of seeking help to solve the task. Therefore, this pattern and the mechanism which underlies needs to be investigated in future studies. For example, in a task context in which participants have the option to avoid the unfriendly experimenter, since this is more representative for an educational context. Furthermore, a task context in which the time is fixed, and thus independent from seeking help, would be interesting as well. Then, seeking help is not the solution for the desire the avoid the unfriendly experimenter.

Strengths

The current study is a valuable addition to the scientific literature, since it has the following strengths. Firstly, the present research is an innovative contribution to existing literature. Namely, previous research on the effects of willpower beliefs is focussed on the beneficial effects of unlimited willpower beliefs. These studies induce promotion of unlimited willpower beliefs. However, current empirical and theoretical literature suggest that unlimited willpower beliefs could have detrimental consequences as well. If these suggestions are confirmed, it is important to differentiate the positive image of unlimited willpower beliefs. Therefore, the current study aimed to replicate and extend the study of Hendriks and colleagues (2017) – which previously studied help-seeking behaviour in relation with willpower beliefs – and hereby, more insight is gained into the possible detrimental consequences of willpower beliefs and its underlying mechanism. A second strength of the current study is that it was ensured that participants were not familiar with the experimenter and that the experimenter and participant were of the same sex, since these confounds could interfere with help-seeking behaviour and friendliness (Beckes & Coan, 2011; Nadler et al., 1982). Hendriks and colleagues (2017) did not take gender and familiarity in account, which might explain why they did find significant effects.

Limitations and future directions

Despite its strengths, the findings of this study must be seen in light of a few limitations. First, the willpower belief manipulation failed. Possibly, the text participants read which was meant to manipulate their beliefs about willpower was insufficiently clear and unconvincing. Therefore, an alternative analysis has been done. To see whether individual differences in willpower beliefs affect help-seeking behaviour, the same analysis was performed with self-reported willpower beliefs, instead of actual willpower belief condition. Nevertheless, still no effect was found. However, participants reported their willpower beliefs after they did the help seeking task, which could interfere with their self-reported willpower beliefs. Participants could have (unconsciously) altered their answers by means of justification for their time to seek for help. If participants asked for help quickly, they might have wanted to show that they usually have a strong self-discipline, and thus, reported that they had unlimited willpower beliefs. Future studies should improve or alter the willpower belief manipulation. Researchers could either strengthen the manipulation text by emphasising the limitedness of self-control, correcting the

reported summary, and repeating the willpower belief manipulation verbally. Or, they could present participants with a biased version of the Strenuous Mental Activity subscale of the Theories of Willpower Scale (Job et al., 2010) with biased scale anchors to manipulate participants' willpower beliefs. This biased-scale manipulation has been used in prior research to manipulate participants' willpower beliefs (Clarkson et al., 2016; Job et al., 2010, 2013). Regardless of the used method to manipulate willpower beliefs, future researchers should consider testing the manipulation beforehand, since this would ensure a successful manipulation of willpower beliefs.

Secondly, the results showed that manipulated friendliness of the experimenter succeeded since there is a difference between the groups. However, the unfriendly experimenters were not reported as actually unfriendly, since the average score on perceived friendliness of the experimenters in the unfriendly condition was still not lower than 2.5, the mid-point of the Likert-scale. Therefore, in current study, no certainty can be given about participants' perception of friendliness of the experimenter. Interestingly, after the debriefing, some participants mentioned that they found the experimenter unfriendly during the experiment. Nevertheless, they did not report the experimenter as unfriendly. Even though the experimenter left the room before this last question, social desirability could have played a role (Norwood & Lusk, 2011). Future research must consider taking social desirability into account. A commonly used method to control for social desirability is using the Marlowe-Crowne Social Desirability Scale as a covariate, since this scale measures socially desirable responding (Fischer & Fick, 1993).

Furthermore, the method executed in the current study and in the study of Hendriks and colleagues (2017) possibly makes one wonder if help-seeking behaviour was necessarily the factor which was measured. Setting the goal of solving the puzzle could induce a feeling of persistence in which asking for help could cause a feeling of giving up rather than asking for help. This way, believing that willpower is unlimited could result in higher persistency – which is suggested in an earlier study by Jędrzejczyk and Zajenkowski (2018) - and subsequently, less help-seeking behaviour. Therefore, it begs the question if persistence is the factor measured instead of help-seeking behaviour. However, the study of Siemann (in prep), corrected for possible interference with persistence by means of an additional task context in which one's goal was to learn, instead of to perform. Consequently, one is more likely to ask for help to learn how to complete the task (Karabenick & Dembo, 2011), and still be persistent in trying to solve the

tasks. The task was not finished after asking for a hint during the task, as in the current study, to stimulate persistence as well as help-seeking behaviour. Siemann (in prep) found no differences between both task contexts. Therefore, there is no support for effects of willpower beliefs on help-seeking behaviour, independent from persistence. Further research into methods measuring help-seeking behaviour is necessary to optimise ecological validity of future studies about the effect of willpower beliefs on help-seeking behaviour. These insights could give more certainty about the method executed measuring help-seeking behaviour representative for real-world settings.

Next, something which stood out was that the participants who did not ask for help, were all manipulated with the unlimited willpower belief. Although, these participants were treated as if they asked for help after fifteen minutes, which could skew the results. Namely, it could be that the effect of willpower beliefs on help-seeking behaviour would be stronger if these participants were considered differently. A possible method to reduce this problem in further research lies in a different help-seeking task. The help-seeking task which was executed by Siemann (in prep) in which participants had to solve several difficult and solvable riddles provided more options to ask for help whereby the scope of the data became broader. Therefore, the chance that participants will not ask for help, becomes smaller.

A final limitation is that participants could (unconsciously) have many reasons for displaying less effort following a demanding task. Participants may simply decide that they have done enough, they are no longer interested in doing their best (Job et al., 2015) or they just want to leave the room as quickly as possible (because of the unfriendly experimenter). To gain a better understanding of the underlying mechanism, it would be relevant to study motivation as a moderator by means of an additional measurement of motivation or an additional condition in which motivation is manipulated (e.g. with an incentive).

Conclusion

Despite the limitations, the findings of the current study add to our understanding of the effect of willpower beliefs on help-seeking behaviour and its underlying mechanism, namely social proximity as a compensation of lack of self-control. No effects of willpower beliefs on help-seeking behaviour were found and friendliness of the potential help-giver did not seem to play a role in this effect either, which was not in line with previous theoretical and empirical literature. However, the current study has several limitations and no firm conclusions can be

drawn. Although Hendriks and colleagues (2017) found effects of willpower beliefs on help-seeking behaviour, some caution is suggested to the interpretation of these results, given the current findings. To gain a better understanding of the effects and underlying mechanism of willpower beliefs, further research is necessary, in which the willpower belief manipulation is effective, social desirability is taken into account and the help-seeking task is optimised.

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Appendix 1: Scripts for friendly and unfriendly condition

Friendly condition
During the friendly condition, the experimenter will act politely, will smile and behave in a calm and reassuring way. He/she is enthusiastic and friendly towards the participant.

Picking up participants
Hoi, [voorstellen wie je bent]. Wat fijn dat je mee wilt doen met ons experiment!
Zullen we naar de ruimte lopen? Je mag mij achternalopen.

Arrival at the lab
Hier is het lab, ga maar naar binnen [participant voorlaten]. Je mag gaan zitten op die stoel, doe alsof je thuis bent.

Start experiment
Ik zal eerst even wat vertellen over het experiment. Het heet 'wilskracht en cognitie' en het is de bedoeling om de relatie te meten tussen wilskracht en cognitie door verschillende taken en vragenlijsten. Het zal ongeveer drie kwartier duren. Jouw antwoorden zullen alleen gebruikt worden voor deze studie en niet voor andere doeleinden. We kunnen je nu niet de precieze onderzoeksvraag vertellen, omdat dat de resultaten kan beïnvloeden. Achteraf kunnen we je dit wel meer gedetailleerd uitleggen. Al jouw gegevens worden vertrouwelijk behandeld. Jouw deelname is vrijwillig, er zijn geen consequenties aan niet deelnemen en je mag stoppen wanneer je wilt. Aan het einde van het experiment kun je eventueel je e-mail geven of studentnummer, mocht je in aanmerking willen komen voor proefpersoonuren, een bol.com bon of achteraf informatie willen hebben over de resultaten.

Je kunt het nog even teruglezen op dit papier voordat je met het experiment start. Als je akkoord gaat, zou je dan *hier* je handtekening neer willen zetten? Als je vragen hebt, mag je die altijd stellen. Laat maar eventjes weten als je klaar bent.

Participants read and accept informed consent

We zullen nu starten met de Stroop taak op de computer. De instructies voor de taak volgen vanzelf.

Participants does Stroop task

Je mag nu op dit scherm weer verder gaan met de vragenlijst.

Manipulation of willpower beliefs

Start puzzle
Bedankt voor het invullen van de vragenlijsten en het uitvoeren van de taak! Nu gaan we naar het volgende onderdeel, namelijk het oplossen van een puzzel. Op deze manier kunnen we de invloed van individuele verschillen op cognitie meten. Probeer de puzzel zo snel mogelijk op te

lossen. Wanneer je er toch niet uitkomt, kun je mij om een hint vragen. Je mag eerst deze instructies van de puzzel lezen.

Participant reads instructions

Probeer de puzzel zo snel mogelijk op te lossen. Wanneer je er toch niet uitkomt, kun je mij om een hint vragen. Je mag nu van start gaan.

Help-seeking task

- *Option 1: when the participants asks for a hint*
  Top, goed dat je om een hint vraagt. Helaas moet ik je vertellen dat de puzzel onoplosbaar is dus dat een hint je niet gaat helpen om hem op te lossen. Logisch dus dat het niet lukt. :)
- *Option 2: after 13 minutes*
  Je bent nu 13 minuten bezig. Je hebt nog 2 minuten om de puzzel op te lossen. Succes nog even!
- *Option 3: after 15 minutes*
  Je mag nu stoppen met het proberen op te lossen van de puzzel. Logisch dat het je niet is gelukt, hij was namelijk onoplosbaar, haha.

Instruction questionnaires
Als je er klaar voor bent, gaan we nu verder naar het laatste onderdeel van het experiment. Geen puzzel meer gelukkig, haha. Op de computer mag je weer een aantal vragen beantwoorden. Laat maar eventjes weten als je klaar bent.

Completing questionnaires: Brief Self-Control Scale, Theories of Willpower Survey, friendliness-check, age, sex and reward

Debrief
Dit onderzoek ging uiteindelijk niet over hoe je leerde of presteerde tijdens de puzzel, maar over wat de invloed is van wat je gelooft over willpower op het vragen van hulp. Onderzoek suggereert namelijk dat wanneer mensen geloven dat willpower afneemt naarmate je het meer gebruikt hebt, je sneller om hulp zult vragen. Wanneer je gelooft dat willpower niet afneemt, zal dit waarschijnlijk ervoor zorgen dat je minder snel en minder vaak hulp vraagt.

Op dit moment is er nog geen definitief bewijs over of willpower nu wel of niet vermindert naarmate je het gebruikt. Om dit verder te onderzoeken hebben we geprobeerd te beïnvloeden wat jij hierover gelooft. Dit hebben we gedaan door je de tekst over willpower te laten lezen en samenvatten.

Daarnaast was dit onderzoek bedoeld om te onderzoeken of het vragen van hulp beïnvloed wordt door het gedrag van de eventuele hulpgever. Daarom heb ik mij vriendelijk gedragen. Vrijwel alles wat ik zei was gescript.

Als je nog andere vragen hebt over deze studie, kun je contact opnemen met ons. Op het papier van de informed consent kan je onze contactgegevens vinden. Ik hoop dat je het leuk vond om aan het experiment mee te doen. Je bijdrage aan de studie wordt heel erg gewaardeerd.

Unfriendly condition
During the umfriendly condition, the experimenter is authoritarian, will not smile and will behave in a tense manner.

Picking up participants
Hoi, [voorstellen wie je bent]. We lopen nu naar de ruimte van het experiment waaraan je meedoet.

Arrival at the lab
[Zegt niks, laat participant achter je aan lopen. Hard deur dichttrekken]. Dat is de stoel waar je op moet zitten.

Start experiment
Ik vertel eerst wat over het experiment. Het heet 'wilskracht en cognitie' en het is de bedoeling de relatie te meten tussen wilskracht en cognitie door verschillende taken en vragenlijsten. Het duurt ongeveer drie kwartier. Jouw antwoorden zullen alleen gebruikt worden voor deze studie en niet voor andere doeleinden. We kunnen je nu niet de precieze onderzoeksvraag vertellen, omdat dat de resultaten kan beïnvloeden. Achteraf kunnen we je dit wel meer gedetailleerd uitleggen. Al jouw gegevens worden vertrouwelijk behandeld. Jouw deelname is vrijwillig, er zijn geen consequenties aan niet deelnemen en je mag stoppen wanneer je wilt. Aan het einde van het experiment kun je eventueel je e-mail geven of studentnummer, mocht je in aanmerking willen komen voor proefpersoonuren, een bol.com bon of achteraf informatie willen hebben over de resultaten.

Op dit papier kan je het teruglezen voordat je met het experiment start. Als je akkoord gaat, zou je dan *hier* je handtekening neer willen zetten? Als je vragen hebt, stel ze dan. Laat maar weten als je klaar bent.

Participants read and accept informed consent

We zullen nu starten met de Stroop taak op de computer. De instructies voor de taak volgen vanzelf.

Participants does Stroop task

Ga nu op dit scherm weer verder met de vragenlijst.

Manipulation of willpower beliefs

Start puzzle
Je bent nu klaar met de vragenlijsten. Tijd voor het volgende onderdeel. Dit gaat om het oplossen van een puzzel. Op deze manier kunnen we de invloed van individuele verschillen op cognitie

meten. Los de puzzel zo snel mogelijk op. Wanneer je er niet uitkomt, vraag me dan om een hint. Lees eerst de instructies.

Participant reads instructions

Los de puzzel ZSM op. Wanneer je er niet uitkomt, vraag me dan om een hint. De tijd gaat nu in.

Help-seeking task

- *Option 1: when the participants asks for a hint*
  [zucht]. De puzzel is onoplosbaar dus een hint gaat je niet helpen om hem op te lossen.
- *Option 2: after 13 minutes*
  Je bent al 13 minuten bezig. Je hebt nog maar 2 minuten om de puzzel op te lossen.
- *Option 3: after 15 minutes*
  Stop maar met de poging om de puzzel op te lossen. Hij is namelijk onoplosbaar.

Instruction questionnaires
We gaan nu verder met het laatste onderdeel van het experiment. Op deze computer beantwoord je weer een aantal vragen. Zeg even als je klaar bent.

Completing questionnaires: Brief Self-Control Scale, Theories of Willpower Survey, friendliness-check, age, sex and reward

Debrief
Dit onderzoek ging uiteindelijk niet over hoe je leerde of presteerde tijdens de puzzel, maar over wat de invloed is van wat je gelooft over willpower op het vragen van hulp. Onderzoek suggereert namelijk dat wanneer mensen geloven dat willpower afneemt naarmate je het meer gebruikt hebt, je sneller om hulp zult vragen. Wanneer je gelooft dat willpower niet afneemt, zal dit waarschijnlijk ervoor zorgen dat je minder snel en minder vaak hulp vraagt.

Op dit moment is er nog geen definitief bewijs over of willpower nu wel of niet vermindert naarmate je het gebruikt. Om dit verder te onderzoeken hebben we geprobeerd te beïnvloeden wat jij hierover gelooft. Dit hebben we gedaan door je de tekst over willpower te laten lezen en samenvatten.

Daarnaast was dit onderzoek bedoeld om te onderzoeken of het vragen van hulp beïnvloed wordt door het gedrag van de eventuele hulpgever. Daarom heb ik mij vriendelijk gedragen. Vrijwel alles wat ik zei was gescript.

Als je nog andere vragen hebt over deze studie, kun je contact opnemen met ons. Op het papier van de informed consent kan je onze contactgegevens vinden. Ik hoop dat je het leuk vond om aan het experiment mee te doen. Je bijdrage aan de studie wordt heel erg gewaardeerd.

Appendix 2: Informed consent form

INFORMED CONSENT
'WILSKRACHT EN COGNITIE'
Welkom bij 'wilskracht en cognitie', een experiment dat de relatie meet tussen de wilskracht van mensen en hun cognitie op verschillende taken. Lees voordat je deelneemt aan deze studie goed de onderstaande beschrijving van het experiment en vul het toestemmingsformulier op de volgende pagina in als je alles begrepen hebt en vrijwillig toestemt om deel te nemen aan de studie.

Deze studie is uitgevoerd door Yara Wiemer, Robin Siemann, Fleur Dropsie en Dr. Anouk van der Weiden, die studeren en werken aan de Universiteit Utrecht. De studie is goedgekeurd door de Ethische Commissie van de faculteit Sociale Wetenschappen.

Deelname aan het experiment duurt ongeveer 45 minuten. Jouw antwoorden worden gecodeerd en zullen alleen gebruikt worden voor de huidige studiedoeleinden (masterthesis). Als je ervoor kiest deel te nemen, zal je worden gevraagd raadsels op te lossen en een aantal vragenlijsten in te vullen. We kunnen nu niet de exacte onderzoeksvraag van de studie vertellen, omdat dit de resultaten kan beïnvloeden. Na deelname zullen we meer details uitleggen.

Alle antwoorden worden vertrouwelijk behandeld, en in geen geval zullen antwoorden van individuele deelnemers worden geïdentificeerd. Alle data zal worden samengevoegd en alleen op die manier worden gepubliceerd.

Psychologie bachelor studenten van de Universiteit Utrecht kunnen ervoor kiezen 1 PPU te ontvangen voor hun deelname. Psychologiestudenten die niet voor proefpersoonuren meedoen, studenten van de Universiteit Utrecht, andere instituties en niet-studenten, ouder dan 18 jaar, mogen aangeven mee te doen aan een loting waarbij driemaal een Bol.com bon ter waarde van €10,- verloot zal worden. Deelname is geheel vrijwillig, er zijn geen consequenties verbonden aan weigering van deelname en deelnemers kunnen op elk moment stoppen met het experiment.

Als deelnemers verdere vragen hebben over deze studie of hun rechten, of als ze een klacht willen indienen, kunnen ze contact opnemen met de hoofdonderzoeker, Dr. Anouk van der Weiden, a.vanderweiden@uu.nl. Voor het indienen van een officiële klacht, kun je contact opnemen met de klachtenfunctionaris, klachtenfunctionaris-fetcsocwet@uu.nl.

Je wordt verzocht om toestemming te geven voor het gebruik van je gegevens. Wanneer je verder klikt, geef je automatisch toestemming dat je gegevens worden gebruikt voor wetenschappelijk onderzoek. Ook verklaar je hiermee dat je 18 jaar of ouder bent en dat je bovenstaande informatie hebt gelezen.

Bij voorbaat dank voor je deelname!

Als je nog verdere vragen hebt, dan kan je contact opnemen met Yara Wiemer. y.c.wiemer@students.uu.nl.

Informed consent formulier voor participanten

Ik, (naam) …………………………………………… verklaar dat ik de procedure begrijp en ik geef toestemming voor deelname aan de studie 'Wilskracht en cognitie' zoals beschreven in de bijgevoegde informatie.

_____   _____
Handtekening   Datum

_____   <u>UU / HBO / geen student*</u>
Studentnummer   * streep door wat niet van toepassing is

_____
Handtekening experimentleider

Appendix 3: Manipulation text willpower beliefs

Limited willpower beliefs
Beperkte zelfcontrole

Zelfcontrole is een karaktertrek van een persoon om in staat te zijn controle over zijn eigen gedrag uit te oefenen. Dit betekent dat een persoon kan handelen naar zijn ideaal en ongewenste impulsen kan weerstaan (Baumeister & Vohs, 2007). Zelfcontrole betekent dus dat een persoon zijn lange termijn doelen, zoals gezondheid, nastreeft en daardoor zijn korte termijn impulsen, zoals nu een koekje eten, kan weerstaan, ondanks dat deze zeer aantrekkelijk kunnen zijn op dat moment.

De gedraging van zelfcontrole bestaat uit twee onderdelen: 1) het in gang zetten van gedrag (initiëren) waarvan je weet dat het op de lange termijn voordelig kan zijn en 2) het nalaten van gedrag (inhiberen) dat op de korte termijn prettig zou kunnen zijn, maar op de lange termijn minder voordelig kan uitpakken (Muraven & Baumeister, 2000). Een voorbeeld van initiëren bij studenten zou kunnen zijn dat een student om 9 uur in de ochtend in de universiteitsbibliotheek zit om te studeren, in plaats van uit te slapen. Een voorbeeld van inhiberen zou zijn dat deze student niet elke keer op snooze drukt wanneer de wekker gaat.

Uit verschillende onderzoeken komt naar voren dat zelfcontrole een beperkte bron is van het lichaam (Muraven & Baumeister, 2000; Baumeister & Vohs, 2007). Deze onderzoeken stellen dat door het gebruiken van zelfcontrole deze bron uitgeput raakt. Als er meer gebruik wordt gemaakt van zelfcontrole is de kans groter dat latere pogingen om zelfcontrole toe te passen zullen falen. Zelfcontrole kan weer worden hersteld door te rusten. In verschillende onderzoeken wordt daarom ook de gelijkenis met een spier gegeven. Zowel zelfcontrole als een spier raken uitgeput na intensief gebruik en hebben rust nodig om te herstellen.

Unlimited willpower beliefs
Onbeperkte zelfcontrole

Zelfcontrole is een karaktertrek van een persoon om in staat te zijn controle over zijn eigen gedrag uit te oefenen. Dit betekent dat een persoon kan handelen naar zijn ideaal en ongewenste impulsen (verleidingen) kan weerstaan (Baumeister & Vohs, 2007). Zelfcontrole betekent dus dat een persoon zijn lange termijn doelen, zoals gezondheid, nastreeft en daardoor zijn korte termijn impulsen, zoals nu een koekje eten, kan weerstaan, ondanks dat deze zeer aantrekkelijk kunnen zijn op dat moment.

De gedraging van zelfcontrole bestaat uit twee onderdelen: 1) het in gang zetten van gedrag (initiëren) waarvan je weet dat het op de lange termijn voordelig kan zijn en 2) het nalaten van gedrag (inhiberen) dat op de korte termijn prettig zou kunnen zijn, maar op de lange termijn minder voordelig kan uitpakken (Muraven & Baumeister, 2000). Een voorbeeld van initiëren bij studenten zou kunnen zijn dat een student om 9 uur in de ochtend in de universiteitsbibliotheek zit om te studeren, in plaats van uit te slapen. Een voorbeeld van inhiberen zou zijn dat deze student niet elke keer op snooze drukt wanneer de wekker gaat.

Uit verschillende onderzoeken blijkt dat zelfcontrole een onbeperkte bron is van het lichaam (Muraven & Baumeister, 2000; Baumeister & Vohs, 2007). Bij een hoog niveau van zelfcontrole zal een persoon beter presteren op het werk en studie (Job, Walton, Bernecker, & Dweck, 2015). Dit komt doordat deze persoon minder snel afgeleid zal zijn en een beter concentratievermogen zal hebben. Hoewel zelfcontrole weleens vergeleken is met een spier, blijkt uit onderzoek dat dit niet op dezelfde manier werkt. Een spier zal na inspanning rust nodig hebben om te herstellen - bij zelfcontrole is dit niet het geval. Na het gebruiken van zelfcontrole kan je je juist energiek voelen en direct een andere inspannende taak uitvoeren. Dit betekent dus dat zelfcontrole onuitputtelijk is.
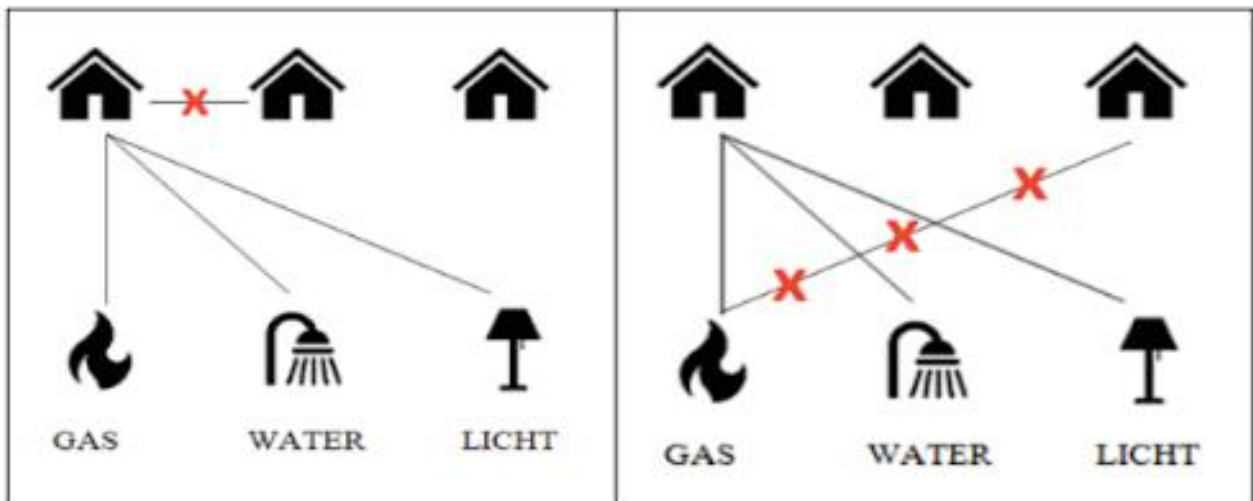
Appendix 4: Unsolvable puzzle

Instructies puzzel

Beste deelnemer,

Je zult zo een puzzel gaan oplossen voor het onderzoek naar de invloed van individuele verschillen op cognitie.

De puzzel bestaat uit 6 figuren. Boven staan 3 huizen en onder staan 3 verschillende tekens (gas, water en licht). Elk huis dient verbonden te worden met gas, water en licht. De huizen onderling mogen niet verbonden zijn. De lijnen mogen elkaar niet kruisen en mogen niet over een pictogram heen gaan. De lijnen mogen wel achter de huizen langs en hoeven niet recht te zijn.

Probeer deze puzzel zo snel mogelijk op te lossen. Wanneer je er niet uit komt, kun je de instructeur om een hint vragen.

Puzzel

Appendix 5: Brief Self-Control Scale

1. Ik kan verleidingen goed weerstaan
2. Ik vind het moeilijk om met slechte gewoontes te stoppen *
3. Ik ben lui *
4. Ik zeg ongepaste dingen *
5. Ik doe wel eens dingen die slecht voor me zijn als ze leuk zijn*
6. Ik weiger dingen die slecht voor me zijn
7. Ik zou willen dat ik meer zelfdiscipline had *
8. Mensen zeggen dat ik een ijzeren zelfdiscipline heb
9. Pleziertjes weerhouden me er soms van mijn (huis)werk af te krijgen *
10. Ik heb moeite met concentreren *
11. Ik kan goed werken aan lange termijn doelen
12. Soms kan ik mezelf er niet van weerhouden iets te doen, zelfs als ik weet dat het verkeerd is*
13. Ik doe vaak dingen zonder goed na te denken 5 over mogelijke alternatieven *

*the scores of these questions need to be reversed

Appendix 6: Theories of Willpower Survey

1. Inspannende mentale activiteit verlaagt mijn energiebronnen. Na een inspannende mentale activiteit dien ik dan ook te herstellen. (herstellen door middel van pauzeren, niks doen, tv kijken, iets lekkers eten)

2. Na een inspannende mentale activiteit raakt mijn energie uitgeput en moet ik goed uitrusten om mijn energie op te laden.

3. Wanneer ik heb gewerkt aan een inspannende mentale taak, dan voel ik me energiek en zou ik direct daarna een andere inspannende taak kunnen verrichten.*

4. Mijn mentale uithoudingsvermogen herstelt zichzelf. Zelfs na mentale uitputting kan ik doorgaan uitdagende taken te vervullen.*

5. Wanneer ik een mentaal inspannende activiteit heb afgerond, kan ik niet direct een andere taak vervullen met hetzelfde concentratievermogen, omdat mijn energieniveau zich moet herstellen.

6. Na een inspannende mentale activiteit, voel ik me energiek genoeg om andere uitdagende taken te vervullen.*

7. Als ik een verleiding weersta voel ik me gevoeliger voor andere verleidingen die zich later voordoen.

8. Wanneer situaties waarin ik verleiding moet weerstaan zich ophopen, vind ik het steeds lastiger om de verleiding te weerstaan.

9. Wanneer ik net een grote verleiding heb weerstaan voel ik me gesterkt om andere verleidingen te weerstaan.*

10. Ik vind het moeilijk om verleiding te weerstaan als ik net een andere verleiding heb moeten weerstaan.

11. Het weerstaan van verleidingen activeert mijn wilskracht en zorgt ervoor dat ik nieuwe verleidingen beter kan weerstaan.*

12. Mijn capaciteit om verleidingen te weerstaan is ongelimiteerd. Zelfs wanneer ik een grote verleiding heb moeten weerstaan, dan lukt mij dat de keer erna ook.*

*the scores of these questions need to be reversed