Are you for real?
Applying construal level theory to hypothetical questionnaires

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Abstract

In this research we theorize on the role of construal level theory (CLT) in as explanation for the hypothetical bias in contingent valuation studies. This is the tendency of people to overestimate their willingness to pay in hypothetical questionnaires. Following previous research, we hypothesize that increasing the psychological distance in terms of hypothecality causes people to think more abstractly, or in higher construal. This construal level moderates whether people use desirability aspects or feasibility aspects when they determine their valuation of a situation, person or object. More specifically, people in high construal use desirability aspects, whereas people in low construal use feasibility aspects. We conducted two studies in which participants evaluated souvenirs. In Study 1, we investigated whether people facing a hypothetical purchase decision are in a higher construal state than people facing a real purchasing decision. In Study 2, we investigated the moderating role of construal level on the relationship between desirability or feasibility aspects on the valuation. We were unable to confirm the hypotheses in these studies, which was possibly caused by suboptimal condition manipulation. In future studies the experimental manipulation should be improved, because if the hypothesis could be confirmed, the impact on the way to handle the hypothetical bias is pervasive.

For a competition authority it is critical to define the market correctly. Without an accurate market definition it cannot identify significant market shares. Usually, competition authorities like to define the market using revealed preferences of consumers. The technique used is the Small but Significant and Non-transitory Increase in Price (SSNIP) test (Motta, 2008). In this test, the authority defines a small hypothetical market. It tries to find out if it is profitable if all the suppliers within the hypothetical market simultaneously raise their prices significantly and durably. If this question is answered positively, the market is defined correctly. If consumers are unwilling to accept the price increase, and they switch to other products outside the hypothetical market, then the real market is larger than thought. The competition authority has to define a larger market and repeat the procedure. This continues until the price increase is profitable.

The methods with the highest validity are based on revealed preferences[1] and include econometric analyses of price correlation, demand price elasticity and diversion ratios (Bishop & Walker, 2010). This approach however put some strong demands on data availability and is therefore often not feasible. Therefore competition authorities have two alternative options. They often rely on qualitative SSNIP tests, in which they argue the boundaries of the market. The second option is to use stated preferences[2] in questionnaires, which is necessary when the previous methods do not provide sufficiently clear and undisputed answers. In these questionnaires the authority asks if a consumer will switch to another product (outside the hypothetical market) when all suppliers for a certain product raise their prices with 10%. However, as we argue below, there may be a severe problem with this method.

Recent economic studies have shown that people in hypothetical questionnaires do not attach the same value to products as people encountering the products in reality. Usually, people are willing to pay more in a hypothetical situation than in a real situation. This tendency is called hypothetical bias (Cummings, Brookshire, & Schulze, 1986; Loomis, 2011). Researchers have shown that the use of cheap talk (e.g. Cummings & Taylor, 1999; Loomis, J., Brown, T., Lucero, B., & Peterson, G., 1996; Whitehead & Cherry, 2007) and certainty measures (e. g. Blomquist, Blumenschein, & Johannesson, 2009; Ready, Champ, & Lawton, 2010) are to some extent effective in mitigating the bias. However, it is unknown why these measures are effective. Recently, literature has called for theory development to understand why and under which conditions these measures are effective (Loomis, 2011;

[1] Actual behavior
[2] Stated behavior

Murphy, Allen, Stevens, & Weatherhead, 2005). Theorizing will also help in the development of new remedies to effectively and cheaply estimate people's willingness to pay for products. So far, however, no theory has been linked to the hypothetical bias that could account for the results of the remedies. There is, however, a promising theory developed in psychological journals that, in our opinion, can explain the hypothetical bias and the results from the remedy.

In this research we focus on the construal level theory (CLT) (Trope & Liberman, 2003; Trope & Liberman, 2010) to investigate the hypothetical bias. CLT states that people can think of the same thing in more abstract or in more concrete terms. More interestingly, this theory predicts variations in the appraisal and the choice mechanism in different situations (Leiser, Azar, & Hadar, 2008); increasing the psychological distance between the appraiser and the choice object leads to more abstract representation of this object (Henderson, Wakslak, Fujita, & Rohrbach, 2011). People appraise psychologically distal objects as goals or end states. Psychologically close objects are appraised as means to an end (Trope & Liberman, 2003). This finding has some profound effects on the choices of consumers (Lynch Jr. & Zauberman, 2006). For instance, in a field experiment, participants committed to saving more of their future income than of their current income (Thaler & Bernartzi, 2004). This is because costs of an action loom larger in psychologically close situations. The benefits of an action have greater impact on the choice in psychologically distant situations as this is associated with the long-term goal people have. Hence, saving current income causes people to think about the fact that they can't use the money for other things. Saving future income makes people focus on the benefits of having a financial buffer (Lynch Jr. & Zauberman, 2006).

To the best of my knowledge, CLT has not been used before to validate hypothetical questions. Based on the theory, we predict that people are poorly able to predict how they will behave in a hypothetical situation. People will mainly focus on accomplishing their ultimate goal when making a decision. When the hypothetical situation becomes reality, people will base their decisions more (if not exclusively) on the costs of the behavior needed for accomplishing the goal and consequently behave differently than they predicted.

In the next section we elaborate on the hypothetical bias in valuation studies. Next, we explain the construal level theory and the application to hypothetical questions. More specifically, we will explain how psychological distance influences the construal level and, subsequently, how this affects the prediction people make about their reaction to hypothetical situations. This is followed by linking CLT to the measures to remedy the hypothetical bias.

Finally we tested in two studies the hypotheses that follows from the literature and we discuss the results.

Hypothetical bias

In contingent evaluation studies people are described a hypothetical good and then asked how much they are willing to pay for this good. Originally, this method was developed for valuing public goods, which, by definition, is no market for[3]. As mentioned before, however, this method is also often used for developing pricing strategies for private goods (Venkatachalam, 2004).

The contingent valuation method consists of five steps (Perman, Ma, McGilvray & Common, 2003, p 421). In the first step, researchers decide how to describe the hypothetical product, and how to phrase their questions. In the second step they collect responses and clean it for outliers, missings and other data glitches to determine the average and median willingness to pay in the third step. Under the fourth step, researchers analyse the results and establish the total willingness to pay for the public good. Finally, a sensitivity analysis is required to confirm the results. Of course, for a private good, the fourth step is skipped.

The challenge in the contingent valuation method is to make people react as if they are really facing the described situation. Research has already convincingly shown that people indicate they are willing to pay more in the hypothetical situation, than in the real situation. Typically, people are willing to pay two to three times as much in a hypothetical situation than in a real situation (see Loomis, 2011 Murphy, 2005; Murphy & Stevens, 2004 and Venkatachalam, 2004 for a review). This means that people either overestimate their willingness to pay in the hypothetical situation, underestimate their willingness to pay in the real situation, or a combination of the two. This phenomenon is called the hypothetical bias. This was for instance found in Cummings, Harrison and Rutström (1995). Participants in this study were offered simple electric household equipment for a given price. One group could buy these products for real, while others could only react as if it was real. Significantly more participants indicated they would buy the product in the hypothetical condition than in the real condition.

Not only do people overestimate how much they are willing to pay, but hypothetical situations make people also more price sensitive (Miller, Hofstetter, Krohmer, & Zhang, 2011). In a study by Gabor, Granger and Sowter (1993), participants were asked in a

[3] After all, a public good is nonrival and nonexcludable (Rosen, 2005, p56)

questionnaire to react to prices of the leading brands of a commonly used product. They were asked if which of the competing products they would chose to buy. At the same time, these prices were really implemented in the local super market. This allowed the researchers to compare the demand curve of the real purchasing data and the demand curve in the questionnaire data. They found that the price elasticity in the hypothetical data was a lot higher, than in the real data. Hence, people in the hypothetical situation are more influenced by the prices, than in reality.

Several measures have been implemented to correct for the hypothetical bias. The most important include ex-ante and ex-post measures. The ex-ante measure consists of the use of cheap talk. In the classical method of Cummings and Taylor (1999), participants are simply informed about the existence of the hypothetical bias. The researcher also gives a possible rationale behind the bias, specifically (following Cummings and Taylor (1999)):

> ***Let me tell you why I think that we continually see this hypothetical bias, why people behave differently in a hypothetical referendum than they do when the referendum is real. I think that when we hear about a referendum that involves doing something that is basically good—helping people in need, improving environmental quality, or anything else—our basic reaction in a hypothetical situation is to think: sure, I would do this. I really would vote "yes" to spend the money***
>
> ***But when the referendum is real, and we would actually have to spend our money if it passes, we think a different way. We basically still would like to see good things happen, but when we are faced with the possibility of having to spend money, we think about our options: if I spend money on this, that's money I don't have to spend on other things... we vote in a way that takes into account the limited amount of money we have — This is just my opinion, of course, but it's what I think may be going on in hypothetical referenda.***

The other way of using cheap talk is by warning people that they may have budget constraints (e.g. Whitehead & Cherry, 2007).

The use of cheap talk, however, does not yield reliable results in mitigating the hypothetical bias. Cheap talk seems to be effective only for higher prices, not for smaller prices (Murphy, Stevens, & Weatherhead, 2004) and for those people without much knowledge of the product (Hensher, 2010).

The other type of measure is ex-post correcting the estimates, based on how certain people are of their hypothetical answer. Also this measure comes in two varieties: the first is

indicating on a Likert scale[4] how certain the participant is (e.g. Ready, Champ, & Lawton, 2010). The second method is a simple yes or no question whether the participant is certain about his or her answer. In a comparison, it was found that on the Likert scale, only the two highest scores are comparable with the "fully certain" in the yes/no variant (Blomquist, Blumenschein, & Johannesson, 2009). Thus, only those people who are absolutely sure about their answers will buy the product in reality. Those who are less sure that they would buy the product, will most likely not buy the product in reality. This ex-post calibration method does produce very reliable scores (Loomis, 2011).

There is no unifying theory formulated yet that can explain the hypothetical bias, nor the results of the remedies. In the section below we will elaborate on the CLT, a theory that we hypothesize to be able to explain this.

Psychological distance

Psychological distance in CLT is a very diverse term that was originally operationalised via spatial distance[5], temporal distance[6], social distance[7] or hypothetical or probability[8] distance (Trope & Liberman, 2003). Recently researchers have found more distance dimensions that might be relevant for CLT. For instance, Fiedler (2007) writes about the dimensions: informational distance; experiential distance; affective distance; and perspective distance. Trope and Liberman (2010) suggest proximal versus distal senses and the novelty of the object as additional relevant dimensions.

The different dimensions for psychological distance are interrelated; an increase in the spatial distance, makes people perceive greater psychological distances in the other dimensions. One of the studies investigating this issue used a stroop task[9] in which participants responded to far or close cues that depicted words typical to the spatial, temporal, social or hypothetical distance dimension (Bar-Anan, Liberman, Trope, & Algom, 2007). The study showed that replying to distant cues was difficult when it included psychologically

[4] A multiple point gradual scale ranging from very much not to very much so.
[5] For instance a 10 meter is psychologically further away than 1 meter.
[6] For instance one day in the future, or in the past, is psychologically further away than one hour in the future or past.
[7] For instance an accquintance is psychologically further away than a close friend.
[8] For instance a situation that is maybe happening is psychologically further away than a situation that is happening for sure. Hypothetical distance is to a large extent similar to probability distance because decreasing the probability of something makes it less likely to occur, and consequently more hypothetical.
[9] The stroop task is a well known task in cognitive psychology, in which participants have to respond to cues that consists of two dimensions. The original stroop task was one in which respondents has to react to a written colour, for incance the word "red". However, the word itself was also in colour, for instance, the word "red" was written with blue ink. It was found that people are better their responses when the two dimensions matched (Stroop, 1935).

close words like near, tomorrow, friend, we, sure, or certainly. However, this task was easier with psychologically distant words like far, year, enemy, others, maybe, or possibly. The reverse was true when participants had to react to near cues. Thus, the spatial distance dimension is closely related to the other psychological distance dimensions.

Using a more direct approach, Wakslak (2012) investigated the psychological distance between her participants and an (un)likely event. For instance, in the first study, she described a situation to her participants that they have a cat-owning-friend living close by and a cat-owning-one that lives far away. It is known that a small proportion of the cats have a rare blood type. Participants were then asked to indicate if the friend with a rare blood typed cat lives close by or far away. She found that by making the situation more difficult to imagine because of the lower probability, more participants choose the far friend to own the cat with the rare blood type. Hence, decreasing the probability of this situation by making a situation more hypothetical, leads to increased perceived spatial distance.

There are indications that spatial distance is the most important psychological distance (Trope & Liberman, 2010). In a study by Zhang and Wang (2009), participants were primed[10] with spatial, temporal, hypothetical or social cues. They had to make estimations about the other dimensions, in a similar way as in the previously described study of Wakslak (2012). It turns out that spatial primes did influence participants' estimations on the other scales, but not the other way around. Therefore they conclude that spatial distance is the basis of all psychological distances, or stated differently: other psychological distances are represented in the cognitive process as spatial distance.

Construal level

Construal level can be defined as the level of abstractness people perceive an object, situation, or person with (Trope & Liberman, 2010). This abstractness is measured on two dimensions. The first dimension refers to the amount of details and expected change the person views in the object. The second dimension is goal relevance. A person viewing an object in concrete rather than abstract construal sees a lot of goal irrelevant details.

For instance, people in low construal may think of a bike in terms of the color, the size, the brand, whether it has a bell, etc. On the other hand, people in high construal will eliminate details from their perception of the bike. Which details are eliminated depend on the overarching goals those people have. For instance, people in high construal with the

[10] Set to a specific state of mind.

overarching goal of commuting will perceive the bike in terms of a comfortable and reliability. They will look at whether the bike is comfortable and the puncture sensitivity of the tires. They will eliminate from their perception the color and the brand because they are not relevant. A person in high construal with the goal of racing, will focus on the racing aspects of the bike, such as the size of the tires and the material it is made of. This person does not care about the puncture sensitivity of the tires.

Literature has extensively shown that the level of construal is influenced by the psychological distance (see for reviews Trope & Liberman, 2010 and Trope, Liberman, & Wakslak, 2007). For instance, Bar-Anan, Liberman, and Trope (2006) conducted an implicit association test in which participants were asked to match words representing the level of construal to words representing the psychological distance. As it turns out, people were far better in linking the psychologically distant words with high construal words than with low construal words. The reverse was true for the psychologically close words. Thus, psychological distance and the construal level are related concepts in the sense that psychologically distant objects or situations are correlated with higher construal levels. Psychologically close objects or situations are correlated with lower construal levels.

Moreover, a two-way causal relationship has been shown in several studies. For instance in an extensive study on the psychological distance dimension probability or hypothecality, Wakslak, Trope, Liberman, and Alony (2006) showed that decreasing the probability (or increasing the hypothecality) of an event or object, leads people to make more broad, inclusive and general categories of these objects and events. In another study, the reverse relationship was shown: level of construal influences the perceived psychological distance (Wakslak & Trope, 2009). For instance in the Navon task (Navon, 1977), people have to identify a target letter in a global letter consisting of different local letters (see Figure 1). The global letter is clearly the more abstract and global point of view, whereas the local letters represent the lower construal. Using this characteristic, Liberman and Föster (2009) made participants either find the target letter in the global or in the local letter, thereby manipulating participants in a high or low construal state. Next, participants had to estimate the temporal, spatial, social, and the probability distance of some event. It turns out that people manipulated in high construal state made considerable larger estimates of the psychological distance than people in low construal state.

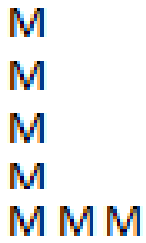

Figure 1: Example of the Navon task. Global letter is the "L", the local letter is the "M".

Some researchers suggested that the relationship between construal level and psychological distance stems from the way people perceive distant objects (Bar-Anan, Liberman, & Trope, 2006; Trope & Liberman, 2010). People see fewer details or changes in objects we observe from afar. To classify these objects, people have to rely on broader more abstract categories. This argument is supported by the finding that spatial distance can influence the other psychological distances, but not the other way around (Wakslak, 2012; Zang & Wang, 2009).

The extensive literature, as described above, leads us to the first hypothesis:

H1: Increasing the psychological distance in terms of hypothecality of an event results in people processing at a higher construal level.

This hypothesis is tested in Study 1.

Impact of construal level

There is strong evidence that the level of construal has a profound effect on the outcome of an evaluation. When people engage in high construal processing, they mainly focus on their values and long-term goals. They think in terms of the abstract question "*why?*". On the other hand, people engaging in low construal processing will focus more on their short-term goals, they are mainly concerned with the concrete question "*how*?" (Eyal, Liberman, & Trope, 2008; Eyal, Sagristano, Trope, Liberman, & Chaiken, 2009; Heller, Stephan, Kifer & Sedikides, 2011; Hunt, Kim, Borgida, & Chaiken, 2010; Kivetz & Tyler, 2007). For instance, Ledgerwood, Trope, and Chaiken (2010) investigated the likelihood people engage in behavior in accordance with their values using temporal distance as explanatory variable. Participants completed a questionnaire to determine what values they deem important. This was later followed by the question whether they would engage in specific behavior that is prototypical behavior for these values. They found that when the behavior was supposedly conducted in the near future (low construal) the values people endorse did hardly correlate with the behavior tendencies. However, a strong correlation was

present between the values and the behavior tendencies when thinking the behavior was supposedly conducted in the far future (high construal). People see themselves as a better person in three years rather than one month (Heller, Stephan, Kifer, & Sedikides, 2011). Also other researchers found this connection between following ones values and construal level (see for a review Trope & Liberman, 2010).

These findings convincingly show that there is a difference in peoples' behavior tendencies, depending on the psychological distance between the person and the behavior. Actual behavior is also influenced by the construal level. One of the more prominent studies on this topic is by Thaler and Bernartzi (2004). In this study they offered half of the participants the opportunity to save part of their current income, the other half could save part of their future income. According to long-term goals, people should have a certain financial buffer. However, in the short term, money dedicated to the savings account has to compete with other more immediate goals, such as an expensive holiday. As CLT predicts, people are more likely to save their future income than their current income. Indeed, participants in the Thaler and Bernartzi study were behaving as CLT predicts. In a similar fashion Rogers and Bazerman (2011) found that people in a high construal tend to make decisions in accordance with the way they think they should behave. This includes contributing to charities and supporting environmentally beneficial (but personal detrimental) policies. Alexander, Lynch, and Wang (2008) conducted four correlational field and laboratory studies investigating the relationship between construal level and the likelihood the participant bought an innovative product. They found that those people who adopt the radical innovative product communicate about it in very abstract terms. Compared to people who bought the incrementally innovative product people in a high construal are more likely to adopt the innovative product, while the opposite was true for participants in the low construal. They also measured actual purchases and found that people initially stated they would buy 'really new products' that best met their desires, but they end up with low risk 'incrementally new products'. This tendency was later confirmed by Arts (2011), who found that people in high construal are more eager to engage in products that are a large improvement from what they use now. On the other hand, when people are actually facing the decision, and hence are in low construal, they adopt less innovative products. Finally, research has shown that products are evaluated in terms of desirability when evaluated for future use, while evaluated in terms of feasibility when evaluated for immediate use (Kim, Park, & Wyer, 2009).

These results summarize to the following: People in a high construal state mainly look at their values, desirability or pro's of actions, whereas people in a low construal state mainly

look at the feasibility or cons of the object or event (Dhar & Kim, 2007; Herzog, Hansen, & Wanke, 2007; Trope & Liberman, 2003; Trope & Liberman, 2010). The attentive reader will notice that none of these studies claim that the construal level influences the perceived desirability or feasibility, only that construal level influences the weight given to the desirability or feasibility factors.

This implies that researchers should differently interpret self-reported tendencies toward hypothetical behavior. People are too optimistic about fulfilling their desires when they face a questionnaire with hypothetical questions. Based on this finding we present the second hypothesis which is visually depicted in the figure below.

H2: Thinking at a higher construal level leads people to pay attention to the desirability aspects, while ignoring the feasibility aspects in their evaluations. A lower construal state leads people to pay attention to the feasibility aspects while ignoring the desirability aspects in their evaluations.

We tested this hypothesis in Study 2.

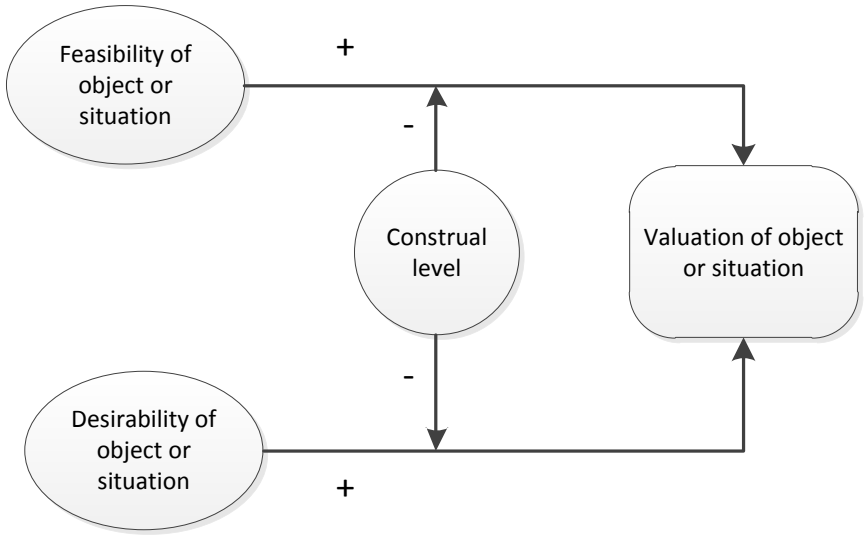

Figure 2: Visual representation of hypothesis 2

CLT and hypothetical bias

It is clear that the hypotheses, when confirmed, can explain the hypothetical bias. As we claimed before, CLT can also account for the remedies to correct the hypothetical bias. The first was the use of cheap talk. In the first version of cheap talk, participants are informed of the hypothetical bias. However, even more important is the explanation for the hypothetical bias in the cheap talk. This may direct people's attention to the low construal aspects of their choice. The same is true for the second version of the cheap talk measure. In this version, people are simply reminded of their budget constraints. This too, is a lower construal

consideration. Hence, the hypothecality of the questionnaire leads to higher construal level, but this is countered by the measure that makes people think in a lower construal.

CLT can also explain the results from including the certainty question in the hypothetical questionnaire to later calibrate the results. As mentioned above, the psychological distance perspectives are interrelated. Thus, perceived psychological distance is increased by the hypothecality of the questionnaire. This means that the perceived certainty is also diminished, as this too is psychologically further away than being completely sure.

We now focus on the broader testing of the theory, though. The propositions have to be tested in future studies.

Overview of the studies

The hypotheses and the relationship between these two are summarized in Figure 3. Increasing the psychological distance leads to more abstractness in the thinking process. This higher construal in turn affects whether people focus on desirability or feasibility aspects in their evaluations.

In the first study we investigated if the level of construal is indeed affected by the psychological distance in terms of hypothecality. In this study we asked participants to respond to the hypothetical or real option to buy products. We predicted that participants responding to the hypothetical option are brought in a high construal state, whereas people responding to a real situation are brought in a low construal state.

In the second study we investigated if construal level effects whether people mainly look at desirability or at feasibility aspects for their evaluations. To investigate this moderating relationship we manipulated people's construal level and let people evaluate souvenirs in terms of feasibility and desirability. We predicted that people focus on desirability aspects when manipulated to think in a high construal. On the other hand, when they are manipulated to think in low construal, people will focus on the feasibility aspects.

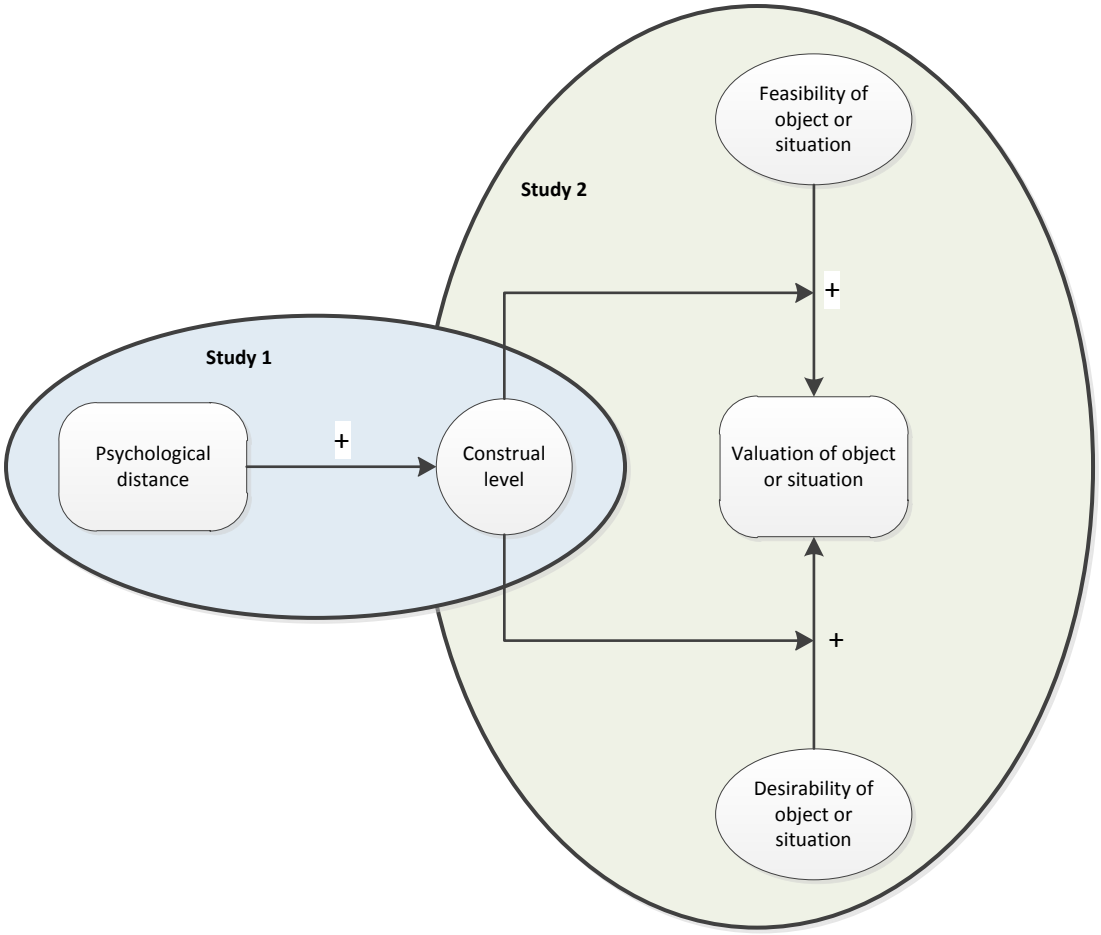

Figure 3: Overview of the studies

Study 1

In this first study we tried to find a positive relationship between psychological distance and the level of construal. Participants faced a real or hypothetical choice, and after they made their choice we measured their construal level. Based on Hypothesis 1, we predicted that people in the hypothetical condition are after the manipulation in a high construal state and people in the real condition are in the low construal state.

Method

Participants and design

Forty-nine undergraduate students participated in this two factor (hypothetical versus real situation) between-participants experiment. Twenty-one participants (2 male) were randomly assigned to the real condition and 28 participants (8 male) to the hypothetical condition. The experiment was conducted in the lab of the social science faculty of Leiden

University and was followed by another unrelated experiment in which participants earned a participation fee of €5,-.

Procedure

After participants entered the lab and signed the informed consent the experiment leader led them to a cubicle where they sat in front of a computer with the instructions[11]. Via the programmed instructions, we informed participants that they could bid for several souvenirs from the university shop (see further explanation on the products below). An offer that was higher or equal than the reservation price was accepted. Participants did not know this reservation price but they did know it was always lower than the retail price. Participants could bid for multiple products. When their offer was accepted for more than one product, they chose which of the offers they liked to execute. We explained participants in the hypothetical condition extensively that their offers were purely hypothetical and would not truly be executed. Nevertheless, we did emphasize though, that they had to act as if it was real. We told participants in the real condition only that they were facing a purchasing decision. Participants were randomly assigned to the two conditions.

When the participants finished reading the instructions, they receive some information about the product and they could indicate for each product if they like to make an offer.

Before the participants submitted their offer, we measured their construal level, using the Kimchi task (Kimchi & Palmer, 1982), which we further explain below. After this measure, participants placed their bids and were informed if their bid was accepted. The experiment was concluded by thanking and debriefing participants and handing over the participation fee. Those participants whose bid was accepted and who were assigned to the real condition received the product at the price offered.

Products

Participants could buy souvenir products. The products included a text marker, a writing block, a cotton bag, a postman bag, a mug (blue or white), a magnet, a stress bal, a small glass, a biking seat cover and playing cards. On all these products the Leiden University logo was depicted and all had a retail price lower than €5. Each participant saw one product at the time. For each product we explained they had the opportunity to make an offer to acquire the product. Apart from the picture and description of the product, we also informed them about the original retail price.

[11] See Appendix I for a selection of the detailed (untranslated) instructions as presented to the participants. More information is available upon request.

Dependent measures

There were two main dependent measures. The first assessed participants' level of construal after the manipulation. We used the Kimchi task (Kimchi & Palmer, 1982; Serra, 2010), which is a common instrument to measure the construal level. In 24 trials, participants were shown squares and triangles made of smaller squares and triangles (see Figure 4 for an example). Participants were asked to look at the top figure and then indicate which of the two bottom figures most closely resembles the top figure. Participants in a low construal state were expected to focus on the local elements of the top figure and hence indicate the figure in the bottom with the same local elements. On the other hand, people in a high construal state were expected to focus on the global elements and to indicate the figure in the bottom with the same global elements. In the depicted example, this means that those in low construal state would highlight the right bottom figure, whereas the people in the high construal state would flag the left bottom figure.

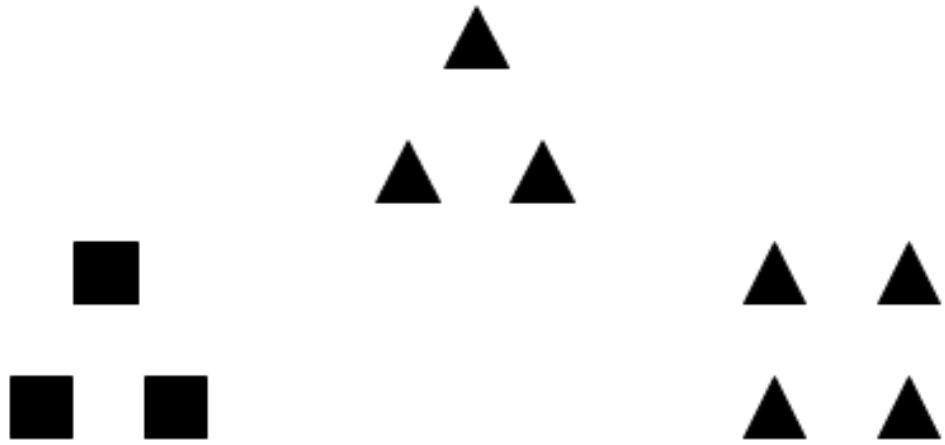

Figure 4: Example of a Kimchi trial

Finally, this experiment was ended with the question how much people were willing to pay for the product they choose to exchange for their participation fee. They could choose any amount possible in steps of 5 €cents using the strategy method[12] (Mitzkewitz & Nagel, 1993; Selton, 1967) as soon as they are reminded about the rules of this process auction.

[12] In the strategy method we asked participants if they were willing to pay a certain price. When they confirmed, we increased the price and repeated the procedure. This method is opposed to the direct response method in which we would ask the participants an open question what they are willing to pay. The results from these

Results and discussion

In Study 1 we investigated the effect of psychological distance in terms of hypothecality on construal level. We predicted that participants in the hypothetical condition are in a higher construal state than those in the real condition. We measured the construal level by registering if and how quickly participants clicked the global or the local figure in the Kimchi task.

In the 24 trials, participants clicked the global figure relatively often (M = 17.37, SD = 6.06). An ANOVA on number of times the global figure was ticked as predicted by the condition did not reveal any differences between the two conditions ($F_{1,47}$ = 0.685, p = .41). However, simple descriptive statistics do reveal that those in the hypothetical condition ticked the global figure on average 18.36 times (SD = 6.21) and those in the real condition 16.90 (SD = 5.89), indicating that the direction of the effect was as predicted.

Also looking at the reaction times of the participants did not reveal any significant differences between the conditions. We looked at the average time participants took to indicate their choice for the global figure and the time they took for choosing the local figure. Putting these dependent variables and the condition as independent variable in a MANOVA analysis results in insignificant results (Philai's Trace = 0.089, $F_{4,43}$=1.048, p = .39). This indicates that the participants did not differ in their reaction times depending on the condition and their answer. Participants in the real condition did not take longer to answer that the figure most resembled the local figure. Participants in the hypothetical condition did not take longer to answer that the figure most resembled the global figure.

Feedback from the participants after the experiment in combination with these results may provide an indication why the results did not match the predictions. It seems as if the reality of the situation in the real condition was not manipulated strongly enough. Participants reacted surprised when they were confronted with the product they successfully bid for. They thought that it was not real. Some participants even rejected their choice and refused to pay for the product. Although the number of refusers was not registered, we estimate that at least five participants fall under this category.

Nevertheless, the direction of the results is promising, especially considering the effect of participants not believing the instructions. Future research will have to confirm this.

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methods are to a large extend comparable (Brandts & Charness, 2011), although the strategy method is more likely to reduce the variance of the answers.

Study 2

In the first study we examined the relationship between psychological distance and the construal level. In the second study we investigated the effect of construal level on the focus on desirability or feasibility. As in Study 1, participants could bid on souvenir products. Based on Hypothesis 2, we predicted that the height of the bid for the products is best predicted by the desirability aspects of those products, but only for people in the high construal. For people in the low construal state, the feasibility aspects are the best predictors.

Method

Participants and design

Sixty undergraduate students participated in this three-factor (low construal, high construal, control) between-participants experiment. Twenty-six participants (11 male) were randomly assigned to the low construal condition, 16 participants (8 male) to the high construal condition and 18 participants (10 male) to the control condition. The experiment was conducted in the lab of the social science faculty of Leiden University. This experiment was combined with other unrelated experiments in which participants earned a participation fee of €6.

Procedure

After participating in two unrelated experiments[13] we first manipulated participants' construal, as described below. Following the manipulation, we offered participants the option to trade some of their participation fee for seven souvenir products from Leiden University. The products were also used in Study 1 and included the text marker, the blue cup, the stress ball, the playing cards, the small glass, the magnet and the biking seat cover. The procedure was to a large extent the same as in Study 1[14]: we showed participants one product at the time and they indicated for each product how desirable and how feasible they considered the product to be. These questions are elaborated upon below. Next, they indicated if they like to bid for this product and finally, they submitted their offer using the strategy method (Selten, 1967; Mitzkewitz & Nagel, 1993) in steps of 5 €cent, and they were informed for which

[13] These experiments include a study investigating the element of surprise and mental occupation on reaction to commercials. The other experiment investigated the effect of inhibited executive functioning and the perception and expression of revenge.

[14] See Appendix II for a selection of detailed (untranslated) instructions as presented to the participants. More information is available upon request.

product they surpassed the threshold price. When they where elegible to buy more than 1 product, they could choose between the products.

The experiment was finished by thanking and debriefing participants and giving them their participation fee. Those participants whose bid surpassed the threshold received the product at the price offered.

Construal level manipulation

We manipulated the level of construal using a traditional method of *how* versus *why* questions (Freitas, Gollwitzer, & Trope, 2004; Strack, Schwarz, & Gschneidinger, 1985). In six sentences, we informed participants about someone intending to engage in certain behavior. We asked participants in the low construal condition to explain *how* the people are going to execute this behavior. We asked people in the high construal condition to explain *why* these people were intending to engage in this behavior. In the control condition, we asked participants alternately *how or why* these people were engaging in this behavior. Thereby we took care that they were exposed to an equal number of male and female target persons. The behaviors are (translated from Dutch): "Thijs intends to open a bank account"; "Annemiek intends to subscribe to a fitness program"; "Henk intends to get some drivers lessons"; "Myrthe intends to subscribe to a news paper"; "Jos intends to learn to play the piano"; and "Nynke intends to buy a computer".

Dependent measures

To assess the desirability of each product, participants rated on a seven-point likert scale four desirability aspects of the products. This included the questions "Do you think you have value for money?", "How happy would you be if you obtain this product?", "How much will you enjoy the product?"

In the same way, participants rated the feasibility aspects of each product via the questions "Is the product user friendly?", "How handy is the product?", "How often do you intend to use the product?" and "Do you think others will approve of your action?"

Finally, people could also bid for the products in the same manner as in Study 1 using the strategy method.

Results and discussion

In the Study 2 we investigated the moderating effect of construal level on whether people focus on desirability or feasibility aspects when valuing the product. According to the

hypothesis, this means that the valuation of people in low construal can be predicted by the feasibility score and not by the desirability score. For the people in the high construal it is the desirability scores, rather than the feasibility scores, that predict the perceived value of the product.

We started analyzing the data by modifying it to correct for biases and increase the interpretability. We first centered the feasibility and desirability scores around the mean score of each participant without losing any variance in the data. This step is necessary to extract the individual tendency to give high or low scores in general. By calculating per product the Cronbach's Alpha for the four feasibility scores and for excluding one of the scores we found the reliability of the composite score for feasibility. We found the highest alpha's for the combined feasibility scores per product when the second item was eliminated from the composite score[15]. Therefore we chose to extract the question "How handy is the product?" from the composite score. We took the same steps for the desirability items. This resulted in the extraction of the first question from the composite score: "Do you think you have value for money?"

The resulting reliability measures for the two composite scores per product are shown in Table 1. The Chronbach's Alpha scores support (or do not reject) the creation of the composite scores.

	Desirability items	***Feasibility items***
Text marker	.767	.880
Small glass	.831	.708
Cover	.810	.803
Cards	.850	.781
Magnet	.849	.663
Blue cup	.790	.799
Stress ball	.829	.803

Table 1: Alpha scores of internal correlation between the different items.

As predicted, in a MANOVA with the desirability items and the feasibility items for each product as dependent variable and condition as independent variable we did not find that

[15] Only for the text marker we found a higher Chronbach's alpha when the second item was included in the composite score. Including the second item did result in the alpha of .892.

condition influences the desirability or the feasibility scores (Philai's Trace = 0.373, $F_{28,90}$ = 0.737, p = .819).

We did predict, however, that the condition participants were assigned to, would predict if the desirability aspects or the feasibility aspects determine the attractiveness of a product, as expressed by the interest and the offer. Therefore we conducted a moderating analysis on whether participants were interested in bidding for the products and on the amount offered.

The interest in a product was measured by the question if the participant wishes to bid for the product. The outcome variable is binary (1= interested, 0 = not interested); hence we conducted a logistic regression analysis with two dummies for the three conditions and the composite feasibility and desirability score as independent variables. We centered the desirability and feasibility scores around its variable mean to reduce colinearity and increase the interpretability of the results. For each product we estimated the following models.

$$Prob(I_{i,p}) = \beta_0 + \beta_1 C_i^l + \beta_2 C_i^h + \beta_3 cD_{i,p} + \beta_4 cF_{i,p} + \varepsilon_{i,p} \quad (1)$$

$$Prob(I_{i,p}) = \beta_0 + \beta_1 C_i^l + \beta_2 C_i^h + \beta_3 cD_{i,p} + \beta_4 cF_{i,p} + \beta_5 D_{i,p} C_i^h + \beta_6 cF_{i,p} C_i^l + \varepsilon_{i,p} \quad (2)$$

$I_{i,p}$	Whether person i wants to bid for the product p (1 is yes, 0 is no).
C_i^x	Dummy for the condition x for person i. Condition x is 1, other is 0.
$cD_{i,p}$	Centered desirability score of person i for product p.
$cD_{i,p}$	Centered feasibility score of person i for product p.

When both (2) is better able to predict the data than (1) and β_5 or β_6 are different from zero, we can conclude that condition has a moderating effect on the relationship between feasibility and desirability and the valuation. However, with six coefficients to be estimated, and only 60 participants, the power of this analysis is severely limited. Therefore we decided to conduct a bootstrapping analysis with 1000 samples, stratified by condition to increase the robustness of the analyses.

The relevant results from these analyses are summarized in the tables below. Looking at the first step in the analysis by estimating model (1), it is clear that desirability is the most important variable influencing whether participants would like to bid for the product or not. Higher scores in terms in terms of desirability make it more likely that participants are interested in making an offer for the product. Feasibility concerns do not seem relevant at all.

Estimating model (2) does not result in any significant results. For none of the products the addition of two interaction terms resulted in a significantly better model, which rejects the moderating relationship in the data. This is confirmed by the fact that none of the interaction terms can explain the likelihood of participants bidding for the product. Hence, for this dependent measure, the actions of the participants disconfirm the hypothesis that construal level influences whether people focus on desirability or feasibility aspects in their evaluation.

	Low construal dummy	**High construal dummy**	**Desirability**	**Feasibility**
	$\beta_1(C_i^l)$	$\beta_2(C_i^h)$	$\beta_3(cD_{i,p})$	$\beta_4(cF_{i,p})$
Text marker	0.143	0.267	1.524**	-0.073
Small glass	-0.967	-0.706	1.701***	0.482
Cover	2.578*	1.462	1.242**	0.398
Cards	1.109	0.299	1.891***	0.679
Magnet	-2.470	-0.636	2.020**	-0.577
Blue cup	0.816	-0.025	2.092***	0.198
Stress ball	-0.809	-0.954	1.133**	0.338

Table 2: Coefficients in model (1). *p*-values are lower than .10 (*), lower than .05(**), lower than .001 (***)

			Desirability		**Feasibility**	
	Step model (2)		$\beta_5 cD_{i,p} C_i^h$		$\beta_6 cF_{i,p} C_i^l$	
	$\chi^2_{df=2}$	p-value	$\text{Wald}_{df=1}$	p-value	$\text{Wald}_{df=1}$	p-value
Text marker	0.531	.767	0.368	.544	0.182	.670
Small glass	1.307	.520	0.925	.336	0.171	.679
Cover	4.807	.090*	2.500	.114	2.696	.101
Cards	2.166	.993	0.078	.780	1.820	.177
Magnet[16]	11.226	.004**	0.000	.983	0.000	.997
Blue cup	2.453	.296	0.791	.374	0.851	.356
Stress ball	0.444	.801	0.081	.776	0.327	.568

Table 3: *p* values of the moderation terms in the logistic regression analysis. *p*-values are lower than .10 (*), lower than .05(**), lower than .001 (***)

[16] Due to high correlation between the desirability and the feasibility variable, calculations could not be completed.

Due to insufficient data we were unable to conduct any reliable analysis on the height of the bids. For instance, with 15 offers, the small glass received the most offers of all the products. This is far from sufficient in an ANCOVA analysis with three main effects and two interaction effects.

However, when we assume that those who did not bid for the products offered zero, we can conduct the ANCOVA moderating analysis. To a large extent this is the same analysis as in the logistic regression described above, due to the skewed distribution of the data, but there is more power in this analysis. The results from this analysis do not differ though, from the logistic regression analyses, with the exception of the ANCOVA for the seat cover. In this analysis we found a significant interaction effect between the condition and the centered desirability score. However, interpreting the slopes of the estimated regression lines show that the effect is opposed to the hypothesized direction. Namely, only desirability scores of participants in the low construal condition predict the offers. Further inspection of the available data points show that only one participant in the high construal condition offered for the seat cover, and ten participants in the low construal condition. This leads to the conclusion that these results are not reliable, due to lack of data.

Overall, we could not confirm the moderating role of construal level. As in the first study, participants did sometimes not believe that the instructions were real. They reacted surprised when they could really buy the products and were reluctant to do so. Also, the internal validity of the desirability and the feasibility questions could underlie the different than predicted results: did we measure the constructs we planned to measure? Although we derived these questions from other studies that investigated desirability and feasibility (e.g. Brandstätter & Frank, 2002; Cohen, Belyavsky & Silk, 2008; Fujita, Eyal, Chaiken, Trope & Liberman, 2008), they are in no way validated. This means that the power of the analysis could be compromised.

General discussion

In this research we proposed that CLT can account for the hypothetical bias and the results of the remedies. We hypothesized that people behave differently than their own predictions in a questionnaire, because in the questionnaire people are in a higher construal than when they encounter the situation for real. According to our predictions, this should determine whether people base their evaluation of the object or situation on the desirability aspects or on the feasibility aspects. In Study 1, which investigates the relationship between

hypothetical distance and construal level, we operationalized hypothecality by creating a situation in which participants imagined that they could buy a product. This was contrasted with the situation in which participants could really buy a product. Subsequently, we measured their construal level in a Kimchi task (Kimchi & Palmer, 1982; Serra, 2010). We did not find that the level of construal was dependent on the hypothecality of the situation. Hence, we could not confirm the first hypothesis.

In Study 2 we measured if the desirability or feasibility aspects of the product were better able to predict the valuation of this product. Moreover, we measured if this differed between people in a high, and people in a low construal state. To this end we manipulated the construal level of the participants and measured the perceived desirability, feasibility and valuation of the products. We did find that the desirability aspects mattered for the participants in their valuation, and feasibility aspects did not. This effect was not moderated by the construal condition. We could therefore not confirm the second hypothesis.

These results are to some extent surprising because this study is trying to find concepts that are strongly based in scientific literature. One possible reason may be that we could not find the predicted results, is because the manipulations may be unsuccessful as indicated by the surprised reactions of participants after the study was completed. Moreover, in Study 1 we found that most participants acted as we predicted participants to behave in the high construal condition. They often ticked the global figure rather than the local figure in the Kimchi task. They indicated in the debriefing that they did not believe the instructions that they could really buy the product. They were even unwilling sometimes to trade their participation fee for the products of their choosing. Speculation leads to the conclusion that in reality all participants in Study 1 were seemingly assigned to the hypothetical condition, which results in high construal levels. The same was true in Study 2, where people were surprised when their offers were really executed. Hence, also in Study 2, it seems as if all participants were assigned to the high construal condition when we followed CLT. This is confirmed by the fact that for all the products the desirability scores could explain the variance in the valuation of the products, never the feasibility scores.

Nevertheless, the reaction of the participants in the debriefing seems to confirm the predictions of CLT in this situation, though not in an experimental setting. Participants filled in their valuations for products while under the impression that they actually did not buy the product. According to CLT, this brings people in a high construal state. When they find out that their offers were actually real, they snap in the low construal and start thinking about the

cons of executing the offer. Suddenly they find out that they rather have the participation fee than the product they bid for and they refuse the product.

Being deceived more often in experiments is a possible reason for participants not believing the instructions. Most participants were undergraduate psychology students who were experienced in participating in experiments. Many of the experiments from social psychology include some form of deception, creating sceptics among the participants when they get more experienced. This is also the reason deception is not allowed in experiments conducted by economists (Croson, 2002; 2010).

Future research should be conducted to confirm the reasoning that the participants pool was corrupted. This can be done by either conducting the same experiment with a different participant population, one that is not (yet) sceptical toward the experimental instructions. Another option is using the same participant population but making absolutely clear that the instructions are real, for instance via signing of contracts. The risk, however, is that a confounding variable is implicitly created by emphasizing the reality of the situation. People may act differently than in real life simply because the experimenter stressed the reality of the situation.

One can also further exploit the fact that some participants do not follow through in their purchasing decisions they indicated while under the assumption that the situation was hypothetical. A study could for instance include participants who deliberately are told that the situation is hypothetical, while filling in some questions to evaluate products and measure their construal level. When they completed the questionnaire, they get the option to really buy those products. This is followed by another construal measurement. Based on the theory we would predict that the construal level at the last measure is lower than the first, as the latter is in a real situation with little psychological distance.

Other types of (quasi) experiments can also be conducted. When the hypotheses are confirmed with lab studies that provide strong internal validity, the step should be made to field studies. For instance, when a company has taken a private decision to increase the prices of their products, researchers can ask consumers if they are willing to accept a hypothetical price increase of this company. The numbers from this survey can be compared with the actual numbers when the company actually raised the prices. According to the theory, the survey asks people to imagine a hypothetical situation, which brings them in a high construal state. This leads people to focus on the desirability aspects of the product. When the price of the product increases, the desirability of the product decreases, and so does the willingness to accept. However, when the company actually increased the prices consumers are in a more

low construal state. This leads them to focus on the feasibility aspects of the product in their evaluation. Feasibility concerns include questions such as: "Do I have the time, energy and willingness to look for a substitute?" This will increase the willingness to accept the higher price, because many people will answer this question negatively. Hence, following the CLT, people are more willing to accept the actual price increases than the hypothetical price increases.

If this theory can be confirmed, it will spur new research on the hypothetical bias and how to correct it. Researchers should therefore consider the role of CLT seriously in contingent valuation studies. Really!

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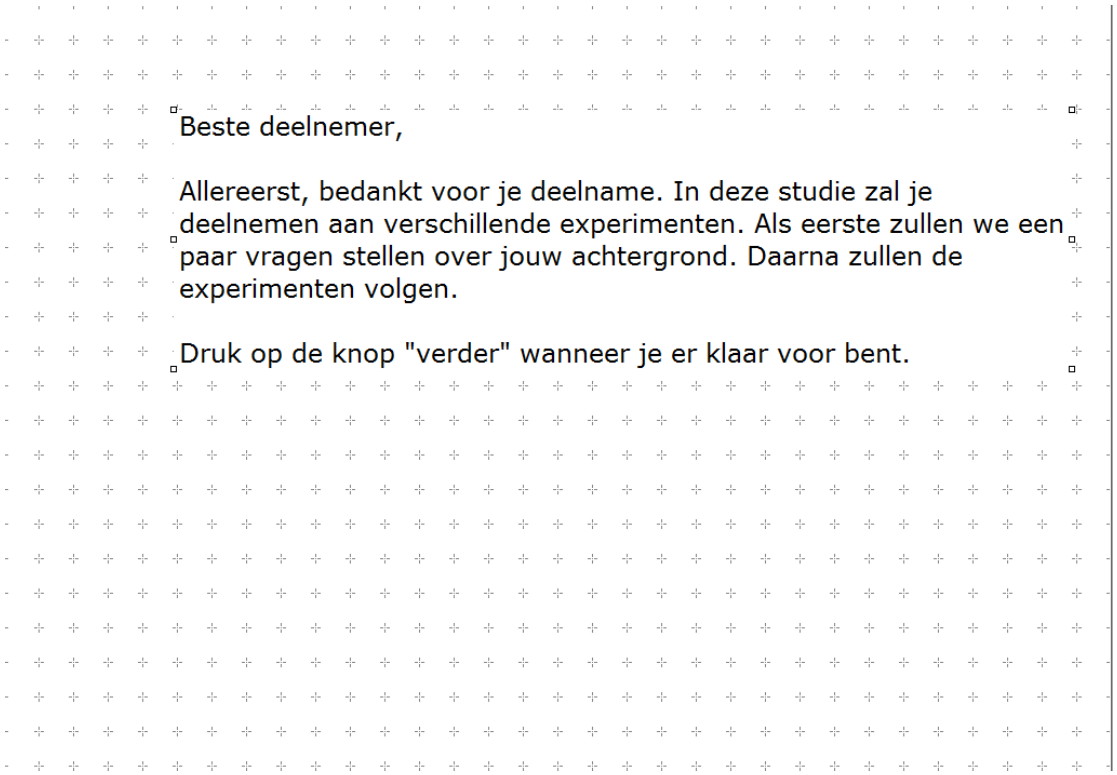
Appendix I

Below we depicted the most relevant instructions given to the respondents in the first experiment. For more details, please contact the author.



Met deze studie verdien je E5,-.

Je hebt nu de mogelijkheid om een deel van dat geld te gebruiken om een leuk product met korting te kopen.

Je krijgt straks 10 verschillende producten te zien. Voor elk van die producten geef je aan of je erin geinteresseerd bent.

Je kan vervolgens de producten, waarin je interesse hebt, kopen door er een bod op uit te brengen. Dit bod moet dan wel hoger zijn dan de vraagprijs. De vraagprijs is voor jou onbekend. Echter, de vraagprijs is altijd lager dan de winkelprijs. De winkelprijs wordt wel bekend gemaakt.

Je kan er ook voor kiezen om voor meerdere producten een bod uit te brengen. Wanneer je bod voor meerdere producten hoger is dan de vraagprijs, mag je kiezen welke van deze producten je wilt hebben voor de geboden prijs.

Je krijgt nu eerst alle producten te zien.

Bij elk product krijg je een plaatje te zien van het product en een korte omschrijving. Ook wordt de winkelprijs vermeld. De vraagprijs is altijd lager dan de winkelprijs.

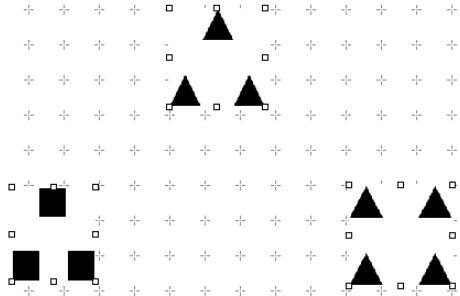
Je kan dan per product aangeven of je er een bod op wilt uitbrengen.

Nadat je hebt aangegeven voor welke producten je een bod wilt uitbrengen volgt kort een ander onderdeel van deze studie. Daarna kan je een bod uitbrengen op de producten die je hebt gekozen.

Klik op "verder" om een keuze te maken uit de producten waar je op wilt bieden.

Gelijkenis tussen figuren

Je krijgt nu een aantal combinaties van drie figuren te zien zoals in het voorbeeld hieronder.



Het is jouw taak om steeds aan te geven welke van de twee onderste figuren het meest op de bovenste figuur lijkt. Volg daarbij je eerste indruk, en volg je gevoel.

Dit doe je door te klikken op de onderste figuur die volgens jou het meest lijkt op de bovenste figuur. Er zijn geen goede of foute antwoorden. Het gaat om jouw eerste indruk. Sommigen zullen meer gelijkenis zien tussen de bovenste figuur en de figuur rechts onder. Anderen zullen meer overeenkomst zien tussen de bovenste figuur en de figuur links onder.

Klik nu op verder zodra je klaar bent om te beginnen.

Het bieden gaat als volgt:

Je ziet opnieuw het product met de omschrijving en de winkelprijs. Vervolgens wordt je gevraagd of je bereid bent om een bepaald bedrag te betalen voor het product. Als je dat bedrag accepteert, wordt er vervolgens gevraagd of je bereid bent om een hoger bedrag te betalen.

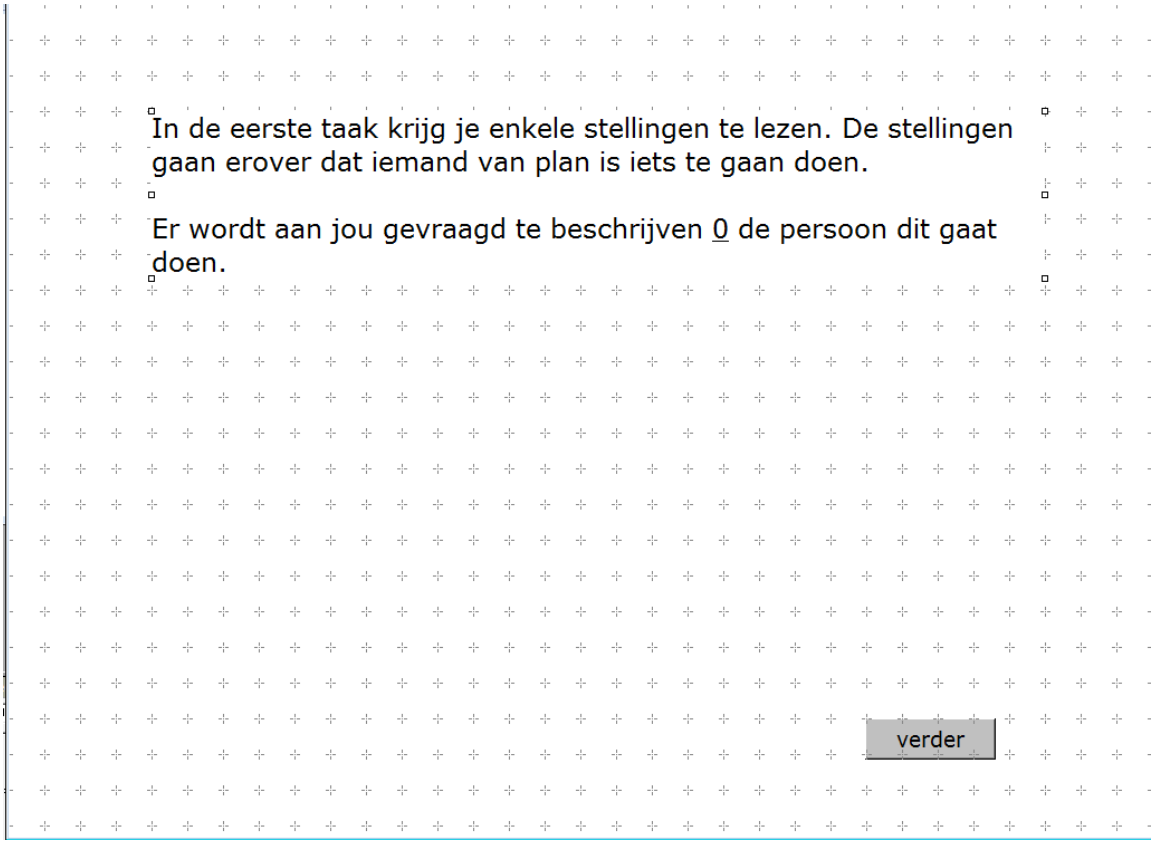
Het bedrag zal iedere keer als je accepteert worden verhoogd met 25 cent. Wanneer je de eerste keer op "nee" klikt wordt het bedrag niet met 25 cent, maar met 5 cent verhoogd. Als je voor de tweede keer op "nee" klikt, wordt het bedrag dat je het laatst hebt geaccepteerd vast gesteld als het bedrag dat je wilt betalen.

Als laatste krijg je te zien wat de vraagprijs is. Wanneer je bod hoger is dan de vraagprijs, kan je het product kopen.

verder

Appendix II

Below we depicted the most relevant instructions given to the respondents in the second experiment. For more details, please contact the author.



Het bieden gaat als volgt:

Wanneer je aangegeven hebt dat je in een product geinteresseerd bent, kan je op het product bieden. Er wordt je gevraagd of je bereid bent om 25 cent te betalen voor het product. Als je dat bedrag accepteert, wordt er vervolgens gevraagd of je bereid bent om een hoger bedrag te betalen.

Het bedrag zal iedere keer als je accepteert worden verhoogd met 25 cent. Wanneer je de eerste keer op "nee" klikt wordt het bedrag niet met 25 cent, maar met 5 cent verhoogd. Als je voor de tweede keer op "nee" klikt, wordt het bedrag dat je het laatst hebt geaccepteerd je bod voor dat product.

Wanneer je je bod hebt gedaan, wordt direct duidelijk of je bod geaccepteerd wordt of niet.

Je bod wordt alleen geaccepteerd als het hoger is dan de vraagprijs. Je weet niet wat de vraagprijs is, alleen dat de vraagprijs altijd lager is dan de winkelprijs. De winkelprijs wordt bij elk product vermeld.

Wanneer je bij meerdere producten een bod hebt gedaan dat is geaccepteerd, kan je kiezen welk van de producten je wilt kopen.

We gaan nu naar de tweede taak.

Zoals we eerder al hebben uitgelegd, krijg je achtereenvolgens 8 verschillende producten te zien. Wij vragen aan jou om die producten te beoordelen aan de hand van een aantal vragen.

Als je interesse in een product hebt, kan je het proberen te kopen door te bieden. Alle producten kan je kopen tegen een prijs die lager is dan de winkelprijs. Je bod moet echter wel hoger zijn dan de vraagprijs.

Je bod is echt. Als het geaccepteerd wordt moet je het product echt kopen voor de prijs die je hebt geboden.

Klik op verder om met deze taak te beginnen.

verder