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Effectiveness of precise and less precise arguments in the wake of happy mood

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Abstract

This study aims to investigate how people agree to precise and less precise arguments and if happy mood affects the agreement to precise and less precise arguments. Four hundred and forty three participants were recruited through Facebook and were randomly divided into the two conditions happy mood condition and neutral mood condition. Participants in both conditions read a scenario where an eyewitness saw a man selling drugs in a club. Eyewitness' credit card showed that she had consumed X (2 or 5) glasses of wine. Later the participants read either one of the arguments from the defense lawyer. A precise argument that "the witness is not trustworthy because she has consumed X (2 or 5) glasses of wine". A less precise argument that "the witness is not trustworthy because she was under the influence of alcohol". Happy and neutral mood was induced with text. People in the happy mood condition read a story about a professor and his students and people in the neutral mood condition read a story about the universe. The results show that there is no difference in how much people agree to precise or less precise arguments. The results also show that happy mood condition did not differ from the neutral mood condition in terms of the participant's agreement to the two types of arguments. The reason for these results can be that the mood induction was not successful.

Keywords: precise argumentation, less precise argumentation, mood, judgment, internet survey

Introduction

To overcome a disagreement in argumentation and get a person to agree to your argument a less precise argument is likely to be used. The argument is undergoing what is called deprecization, which means that a precise term is substituted with a less precise term to hide a controversial premise (Dahlman, Sarwar, Bååth, Wahlberg, & Sikström, in progress). For example, a precise argument can be: "The witness is not trustworthy because s/he has consumed two glasses of wine", and a less precise can be: "The witness is not trustworthy because s/he was under the influence of alcohol". A less precise argument leaves more room for subjective interpretation. Therefor it can get people to agree to arguments they would not agree to or the other way around (Dahlman, et al., in progress). In the example above the interpretation of the less precise argument is about how much alcohol the witness had been drinking and how it affected a persons' trustworthiness. Is the witness drunk and unreliable or is the alcohol consumption maybe irrelevant since the witness has had two glasses of wine spread out over the last four hours? How the witness trustworthiness is judged depends on how a person interprets meaning of the argument and a deprecized argument is made easier to accept and agree to if it is doubtful the precise argument is agreeable (Dahlman, et al., in progress).

How people feel (e.g., hungry, thirsty, alert, tired, happy, sad, angry, etc.) at the exact moment when they are making a decision also affects their judgment (Danziger, Levav, & Avnaim-Pesso, 2011). The present study will investigate how mood can influence agreement to precise and less precise argumentation. When the argument is precise the risk of misunderstanding its meaning decreases and people tend to rely on the facts and the decision is made without consulting mood. But when the argument is vague like in a less precise argument it is leaving more room for individual interpretations (Dahlman et al., in progress) and people tend to use mood as a source of information to simplify the decision (Forgas, 1998). From a practical point of view research about mood and decision making is important for different areas such as jurisprudence (Blumentahl, 2005). In court judges may benefit from the knowledge about how judgments are influenced by all the factors outlined above. That awareness might increase the possibility of a fair verdict (Danziger et al., 2011).

Below the literature review will focus on the process of decision making and how different factors influence that process, like argumentation and mood. The Heuristic Systematic Model and the Affect Infusion Model will be described in relation to precise argument and less precise argument. This will lead to the research questions and hypothesis

followed by a method part where I describe how I approached these questions. Next is a presentation of the results and finally the discussion.

Decision making and argumentation

Decisions have been of interest for researchers for a long time e.g., Milgram´s (1963) famous experiment on obedience to authority. The results were some of the initial findings that show that people tend to rely more on an authority's expertise than on their own thoughts and feelings about how to make a decision. Other researchers have focused on how different mood and physical factors affect judges are making decisions in court (Danziger et al., 2011), the motivational factors underlying the decision in a social context (Chen, Shechter, & Chaiken, 1996) and some have used cognitive strategies (Kunda, 1990) to explain how and why people make decisions as they do.

Different types of argumentation can affect decision making. A precise argument can make it easier to make a decision because it contains clear and direct information. Either the person making the decision agree or disagree to the information in the argument, for example the exact number of glasses of wine a witness have been drinking before s/he witnessed a crime. If it is two glasses, maybe the witness is not judged as being drunk and unreliable. If the witness has been drinking five glasses it can be easy to agree to the argument stating that s/he is not trustworthy because of that consumption. A less precise argument can make it harder to make an accurate decision because the person has to interpret the meaning of the information to a larger extent, for example an argument about a witness who is under the influence of alcohol. How much did the witness drink, was it one glass of wine or is the witness drunk? Lack of detailed information also makes other clues more relevant, like context – was it a Saturday night at a club or an evening dinner with a colleague? A less precise argument is also easier to agree or disagree with, depending on how the person that is going to interpret the argument does it (Dahlman, et al., in progress). According to Chaiken and Maheswaran (1994) an argument that is accepted by a majority is easier for the individual to accept compared to an argument that a minority is agreeing with. An argument given by an expert can be perceived as more accurate than if it is given by a non-expert and likewise a longer message can be perceived as more accurate than a shorter message (Chaiken & Maheswaran, 1994).

An argumentation is often about a disagreement, where one position is arguing their beliefs and the other is arguing the opposite. If one side is sure about getting agreement from the other, they can use a precise argument. But when both sides are in their trenches that is not often the case. In the present study the precise argument about two or five glasses of wine

that is substituted with "under the influence of alcohol" in the less precise argument with the technique of deprecization (Dahlman, et al., in progress). Less precise arguments is used to overcome disagreement and makes the room for interpretations larger, which makes people more inclined to agree. Politicians, for instance, might use less precise argumentation in their speeches; making it easier to agree with and to vote for her/him (Kerkhof, 1999).

Kunda (1990) explored the possibilities that motivation affected reasoning (directional goals) by reviewing literature on the subject and came to the result that people often tend to come to the conclusions they want and uses some of their prior knowledge to arrive at the desired conclusion. This can be put in relation to the precise and less precise arguments where the person exposed to the precise argument is validating the meaning and in the less precise argument has to interpret their own meaning (Dahlman, et al., in progress). The interpretation will be selected from prior knowledge to fit the decision maker's individual goal (Kunda, 1990).

These factors, like processing strategies and motivation, decrease in the shadow of expertise; higher knowledge in the current area makes people less likely to rely on other factors to make their decision (Englich & Soder, 2009). A study about anchoring (the tendency to rely on the first information when making decisions) and how decision making and mood influences the anchoring effect Englich and Soder (2009) found that mood may influence anchoring only when people are in a happy mood, but expertise eliminate this effect. Experts process information without influences of their mood. For example, if people who are interested in hockey gets a question about how many players are there in each team they would answer without effort because of their expertise, whilst people who are not interested would first had to try to remember what it usually looks like when they are zapping by a hockey game on TV. Then they would involve even more cognitive strategies like rule out different alternatives by thinking how many players could actually fit on the ice and so on.

A defense attorney can use less precise arguments to win in court (Dahlman, et al., in progress), for example "the witness is not trustworthy because she was under the influence of alcohol". When the information in a less precise argument is vague and the decision maker is interpreting the meaning subjectively and is in a happy mood, it is not that farfetched to speculate that the mood is consulted (Forgas, 1995) and the motivation is to get to a desired conclusion (Kunda, 1990) which often is in line with the first information they get (Englich & Soder, 2009). That information is, in this court example, manipulated by the defense attorney in to a less precise argument that could be easier to agree with.

Dahlman and colleagues (in progress) investigated if people would agree more or less with a less precise version of an argument about witness reliability depending on the witness age. The results showed that people find it easier to accept the less precise argument and agree on that the witness is less reliable because of her age when the age is four, nine, twelve and fourteen years, but not at the age seventeen and nineteen years.

The Heuristic-Systematic Model (HSM). The basic assumption of HSM is that if one is going to make a decision one would want to estimate the validity in the information one is going to base that decision on (Chaiken, Liberman & Eagly, 1989).

Heuristic process is a decision making process based on rules, habits, memory and judgmental beliefs (Chaiken & Chen 1999). The heuristic process is less cognitively demanding and further relies on internalized knowledge structures and also cues in social settings, like stereotyping, like for example "experts can be trusted". The heuristic processing can also include mood as a clue to make decisions (Chaiken et.al., 1989). For example, people often choose to buy the same cheese that they usually do because of habit and the memory of liking that cheese.

Systematic processing is the analytic more cognitive demanding decision making, for example when people evaluate the consequence of buying a different kind of cheese than they usually do because there is a salesperson promoting cheese in the store and there is a special offer, like a reduced prize. The systematic process is taking in to account all information available and analyzes from different angles to make a decision and is more cognitively capacity demanding (Chaiken et.al., 1989). These processes can, but do not always, work together to make a decision that is the most accurate with the least effort (Chaiken & Chen 1999).

Even if a person should make a more correct decision by engage in systematic processing the heuristic process can be chosen when the need of economize with the cognitive resources is valued as more important than accuracy in the decision made and the other way around (Chaiken, 1980).

Chen and colleagues (1996) study examined heuristic and systematic processing of individuals discussing a matter with a person they did not know but were they had the prior information of whether the person was for or against the matter they were about to discuss. The results show that people with the goal to have a pleasant conversation, impression-motivated people, used a heuristic processing and were biased by their discussion partners. They selected opinions that matched the discussion partner's opinion. People who were driven by principles instead, accuracy-motivated people, used systematic processing and their

opinions was not biased by the discussion partners. These two motivation types can also be mixed but people tend to be more or less on one side (Chen, et al. 1996).

Different argument types can influence this economical way of using cognitive resources because of the information provided in the argumentation. In precise argumentation distinct information is given to the recipient and that can have the effect that a heuristic way of processing the information is enough. A less precise argumentation can engage the recipient in more systematic processing to interpret the information to be comprehensible. This also depends on the kind of information. If the person doesn't have any prior knowledge about a decision that has an important consequence it doesn't matter if it is formulated precise or less precise, the person will then engage in higher level of processing (Forgas, 1998).

The Affect Infusion Model (AIM). Like the HSM the AIM describes heuristic and systematic processing, with the systematic processing labeled as substantive processing AIM has two additional processing strategies (Forgas, 1995). The additional strategies are the direct access processing and the motivated processing. Forgas (1995) means that the direct access processing is the strategy with the lowest amount of intensity. This process is an answer to a familiar situation, when the judge simply can retrieve a response stored in memory. It doesn't engage the person that much and saves energy. The motivated processing claims a bit more thought but is still an energy saver in the way that the person knows what kind of information is needed to make a decision and this strategy is not involving mood that much. This processes can possibly be used when familiar arguments is processed, both a precise and less precise argument can be processed with lower cognitive effort if it contains information the recipient is familiar with. When the information is new for the recipient it is different. According to Forgas (1995) the probability that mood is affecting processing are most likely to occur when it is about difficult and unknown matters that require more cognitive resources. A less precise argument with vague information claims more interpretation of the person who is going to judge the argument (Dahlman, et al., in progress) which involves a higher processing.

The AIM has been used in research of mood congruence, which is how the result of a particular mood corresponds with the actual mood. An explanation of this could be that when the mood increases so does the dependent variable, which is the phenomenon that is being measured. If the measurement is, like in the present study, agreement and that turns out low and so does mood, it is mood congruent. If mood is high and agreement is low, that is called mood incongruence (Davis, Kirby & Curtis, 2007). When the judgmental process becomes influenced and incorporated by affect the outcome of the process is colored by the judge´s

mood. The model implies that affect does not influence the judgment in mood-congruent direction when the process is in a state that does not need that much effort from the decision maker but increases as the process becomes more extensive and constructive (Forgas, 1995).

Mood

Moods are "low-intensity, diffuse and relatively enduring affective states without a salient antecedent cause and therefore little cognitive content (e.g. feeling good or feeling bad)" (Forgas, 1992, p.230). Mood is likely to influence reasoning because it is general in direction. They are not directed to a specific person or situation like other affective states can be. The mood is sometimes used as a source of information when people try to make information comprehensive before making a decision.

Danziger and colleagues (2011) investigated decisions of judges in court and found that the positive decisions (i.e., lower sentences or penalty) seem to have its peak after morning coffee break and after lunch, while decreasing in between. Their results show an interaction between the factors hunger, alertness, repeated measures and mood in relation to judgment. A happy mood after a food break increased the positive verdicts. When in a happy mood the processing of information is shallower and does consume less time than when in a sad mood (Forgas & Bower, 1987).

Mood has shown to have influence in the amount of time it takes to make a decision. According to Forgas and Bower (1987) people in a happy mood makes positive judgments in shorter time than negative judgments. It´s also easier to form positive impressions and the effect of the happy mood is stronger than the negative (Forgas & Bower, 1987). To give an example, if a person is happy s/he would agree stronger to an argument than if the person is sad. The shorter time could also be an effect in how people process the information at hand. When in a sad mood the information is processed more thoroughly than when in a happy mood when the process is more superficial (Englich & Soder, 2009). This stronger effect can be seen in the attempts to measure mood after movies, the happy effect shows a stronger impact than sad or aggressive movies that showed ineffectual results (Forgas & Moylan, 1987). It can be that the thinking about mood has an effect in people choosing more positive when they have two possible choices, this is independent of if they are in a happy or sad mood when they are making the choice, for example both a happy and a sad person will pick a comedy over a drama whilst a neutral person (one who didn´t think about mood) will more often pick the drama when told that the comedy is not so good and the drama is outstanding (Caruso & Shafir, 2006).

This study plans to investigate if mood can affect people's agreement to the precise and less precise argument. Four hundred and forty three participants were recruited through Facebook and were randomly divided into the two conditions a happy mood condition and a neutral mood condition. Participants in both conditions read a scenario where an eyewitness saw a man selling drugs in a club. Eyewitness' credit card showed that she had consumed x (2 or 5) glasses of wine. Later the participants read either one of the arguments from the defense lawyer. A precise argument that "The confidence in the witness is adversely affected because she has consumed x (2 or 5) glasses of wine". A less precise argument that "The confidence in the witness testimony is adversely affected by the fact that she was under the influence of alcohol when she made her observations." To test the effect of mood on agreement to the different argument types an internet based survey will be conducted. Mood will be induced through text and the data will be calculated in a 2x2x2 mixed design.

Hypothesis

Hypothesis 1. It is expected that people would agree more with the less precise argument than the precise argument because the deprecization of a precise argument that is hard to agree to makes agreement easier. This is a replication of Dahlman and colleagues, (in progress) experiment which showed that people found it easier to agree with a less precise argument when they found it hard to agree with the precise argument.

Hypothesis 2. It is expected that happy mood would make people agree less to both the precise and less precise argument because happy mood makes people less judgmental. According to Forgas & Bower (1987) happy people are more likely to form a positive impression and Danziger and colleagues (2011) showed decreased judgment when in a happier mood.

Method

Participants

There were 443 participants (168 men, 273 women, 2 undefined), 18-69 years (M = 35.7). They were recruited through Facebook, a social network on internet.

Design

A 2x2x2 mixed design was used. The first factor was the mood (happy or neutral). The second factor was the glasses of wine consumed (2 or 5 glasses of wine) and the third factor was the precision of argument made by the defense lawyer (precise or less precise argument).

Material

Scenario. Participants were given the following scenario:

Daniel A is accused of drug offenses. According to the prosecutor's, he has sold drugs in a disco in Västerås. One of the witnesses in the trial is Carina J, who observed Daniel A while she sat at the bar and drank wine with a friend. In cross-examination with Carina J it emerges that she had x (two or five) glasses of wine when she made her observations. Eyewitness' credit card showed that she had consumed x (2 or 5) glasses of wine. The participants were informed that her reliability as an eye witness was questioned by Daniel´s defense lawyers, because of her alcohol consumption.

Participants were exposed to precise argument or less precise argument and the participants were asked to rate their agreement on a 9 point scale.
The arguments were as follow:
Precise argument:

"The confidence in Carina J´s testimony is adversely affected by the fact that she had consumed x (two or five) glasses of wine when she made her observations."

Less precise argument:

"The confidence in Carina J´s testimony is adversely affected by the fact that she was under the influence of alcohol when she made her observations."

Agreement scale

Each participant then got to decide whether they agreed with the statement or not by estimating from 1-strongly disagree to 9-totally agree.

Scale used:

State to what extent do you agree with this argument on a scale from 1 = ”strongly disagree” to 9 = ”strongly agree”.

○	○	○	○	○	○	○	○	○
1	2	3	4	5	6	7	8	9

Survey Collection. The data was collected online using Survey Monkey, an internet based tool. In the free version you can have up to ten questions and collect up to 100 answers for each survey. The answers are shown either as a group result or one-by-one (Massat, et al. 2009). Survey Monkey is a balanced tool with accessibility and breadth of functionality for most users, which increases the opportunities for people to participate (Gottliebson, Layton & Wilson, 2010).

Participants were contacted on Facebook from the authors contact list. Facebook is a social network grounded in 2004 who had 1.19 billion monthly active users as of September 30, 2013 (http://newsroom.fb.com/Key-Facts).

Mood Induction Procedure (MIP). Happy and neutral mood was induced with texts. The procedure was a replication from Verheyen & Göritz (2009) with a translation of the stories into Swedish. In the happy condition it was a story about a professor who shared a story with his students (426 words, appendix A), and the neutral condition story was about life on earth and other planets (362 words, appendix B). To measure the mood before and after induction a verbal scale was used. The scale consisted of seven estimations from 1-very sad to 7-very happy. Initially two pilot studies were made to investigate the efficacy of mood induction procedures. Both mood induction with video clips (Jenkins & Andrewes, 2012) and music mood induction (Västfjäll, 2002) were evaluated with a small sample of participants and showed unsatisfying effect. Some findings about participant's thoughts about the scenario emerged from the pilot studies that will be discussed later.

Procedure

Participants were contacted on Facebook from the authors contact list. The surveys were randomly distributed to the eight different conditions by using a free randomizer service on internet (http://www.randomizer.org/). By filling in the number of sets wanted, how many numbers per set and number range followed by choices about for example uniqueness of number in the set, a list was created with randomized order and the surveys were sent out in this specific order.

The participants got a message with brief information about the study, its purpose and a link to the survey along with a request to pass it forward when they completed it. The participants read a brief description of the study and were informed that it was voluntary to participate and that they could determine their participation at any time before they completed the first mood estimation. This was followed by the text mood induction. The next step was the scenario and the agreement and finally, the second mood estimation. The first and the last page of the survey contained information about how to contact the author in case of questions about the study.

 The data was collected online using Survey Monkey´s free version and manually transferred to SPSS for calculations.

Results

First the effect of the mood induction text was tested separately for the happy and neutral condition. The results of the t-tests showed that the participants in the happy mood condition became happier after reading the text (t (228) = -3.68; p > .001), while there was no change in the mood of participants in the neutral condition. However, the two conditions did not differ in mood after the mood induction.

To investigate the hypothesis, that people will agree more with the less precise then the precise argumentation and that happy mood will make people agree less with a judgmental argument, a three-way Analysis of Variance (ANOVA) was conducted. The first factor in the ANOVA was mood (happy and neutral), the second factor was amount of alcohol consumed (two or five glasses) and the third factor was precision of argument made by the defense lawyer (precise or less precise). The dependent variable was the agreement score. Results of the Levene´s test showed that the assumption of equal variance was not violated.

The results show that there is no difference in people's agreement to precise argument and less precise argument. The results also show that happy mood does not have an effect on agreement to neither precise argument nor less precise argument (see table 1 for the mean values).

Table 1

Means and standard deviations for the agreement of the scenario´s in the different groups.

Mood	Wine Consumed	Argument Type	Agreement Mean(SD)
Happy	Two glasses	Precise	4,46(2,20)
Neutral			4,81(2,58)
Happy		Less precise	4,53(2,46)
Neutral			4,79(2,15)
Happy	Five glasses	Precise	5,52(2,44)
Neutral			5,22(2,08)
Happy		Less precise	5,62(1,97)
Neutral			5,47(2,14)

Discussion

The aim of the present study was twofold. First, to replicate the findings of Dahlman, et al. (in progress) that states that people agree more with the less precise argument as compared to the precise argument. Second, to investigate if happy mood can affect the agreement to the less precise and precise arguments.

The first hypothesis was that people will agree more with the less precise then the precise argumentation. The results of this study did not replicate the findings of Dahlman, et al. (in progress). The results showed that there was no difference between the agreement to precise and less precise argument. There can be limitations in the scenario used in this study. The scenario was about a female witness that had been drinking alcohol, it could have been different if it had been a man. A man is generally more resistant to the effects of alcohol and the effect of a man in the scenario could have been lower agreement score. The scenario that was replicated had a different witness, a young girl. It can be speculated if the less precise argument in this study "The witness is not reliable because she is under the influence of alcohol" compared to the replicated "I would like to draw your attention to one important circumstance with regard to Jessica Miller's testimony. A child is less reliable as a witness. Jessica Miller is therefore less reliable as a witness" affects participant differently because of the description of the witnesses, a child can be more reliable than a woman under the influence of alcohol. The context in this scenario was different and that can change how reliable a witness is perceived. The child was alone in the street and the woman was out visiting a nightclub where it usually is a lot of people. Additionally, the sentence is longer and that can have the effect of being more credible (Chaiken & Maheswaran, 1994).

It can also be an effect of the formulations in the arguments, that it was not enough difference between the precise and less precise argument. Two glasses of wine could have the same meaning to people as under the influence of alcohol, and definitely five glasses. If the difference in the argumentation did not differ in meaning for the participants, that is what is shows in the results.

The second hypothesis was that happy people would agree less with a judgmental argument. The results showed no difference between happy mood condition and neutral mood condition in their agreement in relation to precise or less precise argument. A possible reason can also be that the mood manipulation was not successful. This research could be repeated with a different mood manipulation.

It was important to test the MIP because it was a prerequisite for the testing of the hypotheses. The ideal results of this analysis would have been that the people in the happy

condition were happier after reading the mood induction text than they were before but also that the people in the neutral mood condition would have no difference in mood before and after reading the text. The desired effect was found in both the happy group and the neutral group. The second condition for an ideal result was that there would be a difference in mood between the groups after reading the text, in the way that the happy people should be happier than the neutral people. The results did not show a difference between the happy and the neutral group even though the means show a slight tendency in that way. That indicates that the mood induction was partly but not totally successful.

The material used for mood induction was adapted to avoid constraints due to the participants internet speed, a text does not demand a high internet connection compared to video clips. It has shown that online participant´s seems to be more positive in their baseline mood estimation than offline participant´s (Verheyen & Göritz, 2009. The positive mood of people online could be an explanation to why there is no difference between the groups in the happy and neutral condition.

Text induction used in the current study has shown to genuinely effect the mood in the wanted direction in other studies (Verheyen & Göritz, 2009) but the duration of the mood state when manipulated online needs to be examined. The participants attention was not controlled for, a possible scenario is that they took a break somewhere in the test or that they just clicked next instead of reading the text and in that case the lack of difference between the groups could derive from that when the duration of mood manipulated online is not known.

When in a happy mood it takes less time to make positive judgments than it takes to make a negative. It´s also easier to form positive impressions and the effect of the happy mood is stronger than the negative (Forgas & Bower, 1987). When in a sad mood the information is processed more thoroughly than when in a happy mood when the process is more superficial (Englich & Soder, 2009). According to the heuristic-systematic model one explanation could be that the information in this studies scenario is processed in a more heuristic manner, with small effort caused by previous knowledge and judgment-relevant cues. In the cases were it took longer time it can be a question of insecurity in the heuristic process and the participant had to engage in systematic process to make a decision or, as mentioned before, the participant took a break and did something else in between. It is uncertain if the time it took participants to read the scenario and decide about how much they agreed was processed in a heuristic or systematic way. Mood influences decision more when the judgment is about something unfamiliar. Maybe the scenario was familiar for the participants and there was no mood influencing their agreement. It can be assumed that

participants have a prior knowledge about alcohol and the effect it has on memory accuracy but most people have not that much prior knowledge about drugs and witnessing drug dealing and that can be an argument in favor of the more systematic processing.

Another possibility can be the explanation of an authority. People who were exposed to the less precise argumentation in the pilot studies said that "someone" already knew she was under the influence of alcohol, which shows that there is some kind of believe in someone´s expertise and a tendency to not process the information that thoroughly when "somebody" else already made the decision that she´s drunk. People have a tendency to be economical with resources and therefor make a decision that demands the least effort. In a case were an authority figure makes a statement it can be a way to minimize the processing and implement the cues in the argument already established by someone else.

The scenario used for the replication could have been about something else, more engaging, it is hard to say if the replication did not work or if it was the scenario that caused the lack of results. The only condition where the results showed a difference was, not that surprisingly, an effect on argument caused by the wine condition, the agreement was stronger when the witness had had five glasses of wine compared to two, and the effect was significant. That tells us that the amount of alcohol consumed is affecting how trustworthy the witness is perceived.

The observed power of the study is low and a larger sample of participants could decrease the risk of a type-II error. The instrument used could be chosen with different possibilities of limitations. Even if the information and the instructions are written carefully there is no way to make sure that the participants are following them in this study. There are instruments that have a design were one can limit the time or make sure the participant stay on the reading page for a specific time, for example two minutes that could have been appropriate in this study. Here, the limitation possible was to make sure the participant could not continue without giving an answer but that was what could be done with the free version of this instrument. The possible gender bias could have been controlled for by using a man in half of the surveys sent out, or by making the survey gender neutral.

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Appendix A

Author unknown. "Glasburken och två koppar kaffe", traditional narrative. Revised by author.

När saker och ting i Ditt liv nästan har blivit för mycket för Dig att hantera, när dygnets 24 timmar inte känns nog, kom ihåg glasburken och två koppar kaffe:

En professor stod inför sina filosofistudenter med några föremål på bordet framför sig. När lektionen började lyfte han under tystnad upp en mycket stor och tom glasburk och började fylla den upp till kanten med golfbollar. Han frågade sedan sina studenter om burken var full. Studenterna samtyckte till att den var det. Då lyfte professorn upp en ask med småsten och hällde dem i burken. Han skakade den lätt. Småstenarna rullade ner i tomrummen mellan golfbollarna.

Återigen frågade han studenterna om burken var full. De höll med om att den var det. Därefter lyfte professorn upp en ask med sand och hällde sanden i burken. Naturligtvis fyllde sanden upp resten av tomrummen. Han frågade ännu en gång om burken var full. Studenterna svarade med ett enhälligt "ja". Då lyfte professorn fram två koppar kaffe som stått under bordet och hällde hela deras innehåll i burken, vilket effektivt fyllde upp det återstående tomrum som kunde finnas kvar mellan sandkornen.

Studenterna skrattade. "Nu", sa professorn medan skratten klingade ut, "vill jag att ni påminns om att den här burken representerar ert liv. Golfbollarna representerar de viktiga sakerna. Familj, barn, hälsa och annat som ligger passionerat i ert hjärta. Sådant som - om allt annat gick förlorat och bara dessa återstod - ändå skulle uppfylla och berika ert liv. Småstenarna representerar andra sakerna som betyder något, som ett hem, jobb och bil. Sanden representerar allt annat - småsakerna.

"Om ni lägger sanden i burken först", fortsatte professorn, "går det inte att få plats med golfbollarna eller småstenen. Samma sak är det med livet. Om du lägger all tid och energi på småsaker finns det inte plats för det som är viktigt för dig. Så... var uppmärksam på det som är oumbärligt för din lycka och förnöjsamhet. Umgås med dina barn.

Ta med din partner ut på middag. Ägna en omgång till åt det som gör dig passionerad. Tids nog kan du städa huset och annat som är mindre viktigt. Ta hand om "golfbollarna" först - sakerna som verkligen betyder något. Återställ det som är viktigast i ditt liv. Resten är bara sand." En av studenterna räckte upp sin hand och frågade vad kaffet representerar. Professorn log. "Jag är glad att du frågar. Kaffet finns med för att visa er; att hur fullt och pressat ert liv än känns, så finns det alltid plats för en fika med en vän."

Appendix B

Om livet på jorden – och bortom. Revised by author.

Livet på jorden tror vi oss känna till i detalj. Men hur är det med liv utanför vår klotformiga värld? Det vet vi mindre om – ingenting, närmare bestämt. Men från och till tror vi att det finns liv på fjärran himlakroppar.

Synen på liv i universum har växlat starkt från en tid till en annan. För att man över huvud taget ska kunna tala om liv i universum måste universum själv först upptäckas. Att göra det har tagit sin rundliga tid under människans långa utvecklingshistoria.

Den antika uppfattningen om världens konstruktion var att jorden var människornas hemvist, tillsammans med djur och växter och allt annat som hör livet till. Vad som fanns utanför jorden, ovanför jordytan, var möjligen gudarnas tillhåll. Och dit kunde inte människan nå. Himlakropparna kunde genom sina rörelser och med dem förändrade lägen ge oss tecken från gudarna som, om de tolkades rätt, gav vägledning för jordevarelserna hur det var lämpligt att uppföra sig.

Men för några hundra år sedan blev det uppenbart att jorden inte var unik. Man insåg att det fanns andra himlakroppar, planeter, som i likhet med jorden rörde sig i banor kring solen. De kunde då ha liknande egenskaper som jorden, till exempel hysa mänskligt liv. Universum blev på så sätt befolkat, men av folk vi inte hade möjlighet att kontakta. Inte ens "marsianerna".

Samtidigt med denna utveckling på den astronomiska scenen försiggick en omvärdering av jordens historia. Inom geologin visade det sig att jorden föreföll vara mycket gammal, inte de cirka 6 000 år som Bibeln antydde. Det handlade i stället om miljoner eller till och med miljarder år. Inom biologin definierades evolutionen, dvs. att de jordiska livsformerna långsamt förändrades och anpassades till skilda och förändrade miljöer.

Under 1900-talets sista år började man upptäcka planeter kring fjärran stjärnor, så kallade exoplaneter. Detta var väntat, men den tekniska utvecklingen måste ha sin gång för att dessa upptäckter skulle bli möjliga. I dag står vi därför inför ett universum som fullkomligt vimlar av planeter. En ansenlig mängd av dessa liknar antagligen jorden och torde vara beboeliga, även om just sådana ännu inte hittats med säkerhet. Ytterligare någon tid av teknisk utveckling förväntas dock lösa detta problem.