

Bachelor Thesis



**Face to Face- would you lie to yourself?**

Does a mirror increase people`s self-awareness  
and their use of self-references while lying?

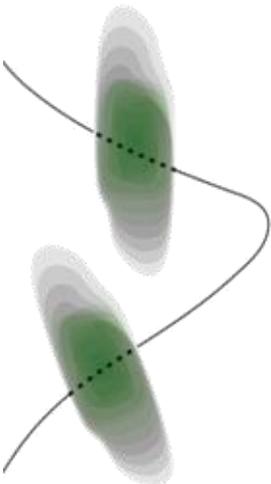
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## 1 Abstract

To substantiate the fact that there is a decrease of first-personal singular pronouns people use while being dishonest, a closer look was taken on what kind of effect a manipulation of self-awareness could have on self-references people use while lying. The participants' private self-awareness was manipulated by using a mirror because it was believed that a mirror serves an instrument to intensify the quantifiable effects of lying on language. Totally 31 males and 57 females participated in this experiment. They were randomly divided into two conditions. 44 people participated when the mirror was present and 44 people participated when the mirror was absent. The results showed that no significant effect was found. The use of first-personal singular pronouns did not decrease when people were lying compared to when people were telling the truth, and this effect was not reinforced by the presence of the mirror.

## 2 Introduction

Do you recall the last time you lied? Was it last week, a couple of days ago or maybe even today? Lying occurs very often and not always in a conscious way; it occurs in different forms and with different consequences. One case of lying that became popular over night and even had an impact on the political landscape of a country is the allegation of plagiarism against Karl-Theodor zu Guttenberg. The man was a highly renowned politician in Germany, considered to be the rising star in German politics, maybe even the next chancellor. His involvement in plagiarism ended his political career in one fell swoop. In addition, the use of plagiarism can also harm the original researcher directly (Fröhlich, 2001).

But there are more implications to a lie than that. Firstly, in their research about the "dishonesty of honest people" Mazar, Amir & Ariely (2008) concluded that "people behave dishonestly enough to profit but honestly enough to delude themselves of their own

integrity” (Mazar, 2008 , p. 633). In other words, people are willing to lie as long as they can sustain their positive self-perception. Getting caught up so much in a lie that the boundaries of truth and false become blurred must take a high physical toll on a person. Maybe it was the same with zu Gutenberg.

Secondly, and very much of interest for this research is that when people are able to lie while they are speaking to others or while they are writing things down, the act of lying leaves traces: the word use of deceptive people, especially the use of first-person singular pronouns, third-person pronouns, emotional words and motion words, can reveal them (Chung and Pennebaker, 2007). Because a certain measure of lying is very common in our everyday lives, and liars can be detected because of the use of definite words as named earlier in the text, and also because it is known that people want to sustain their positive self-perception, it is therefore interesting to know if there is a way to influence peoples self-awareness by using a moderator and if this manipulation can have an effect on peoples use of self-references while lying. The research question of this research paper is thus:

*“What kind of effect could the manipulation of self-awareness by the presence/ absence of a mirror have on self-references people use while lying?”*

### 3 Theoretical frame

#### 3.1 Dishonesty

The human language is probably the most frequently used medium by which dishonesty can be created. Language in specific is a medium which can be used to lie. It makes it possible to illustrate thoughts, emotions and stories, while it is also crucial to understand and take part in other people`s stories or even their lives (Tausczik and Pennebaker, 2010), but not everything humans tell has to be true.

Lying occurs in the everyday life. People lie in many different situations. For example people lie about their attitudes, opinions, feelings and preferences for material gain but also to avoid punishment. People lie to make them feel better, protect themselves and build up a cover around them so that their self-concept cannot be hurt that easily (De Paulo et. al., 2003). But the possibility to be dishonest with information opens the door for a plethora of possible misuses, oftentimes accompanied by rather negative consequences. Examples of such situations are police questionings where potential offenders do not tell the truth about possible dark doings. These bad actions can vary from small offenses to real crimes. Therefore some researchers developed a set of methods which should make it possible to detect lying in different ways (Malcolm and Keenan, 2003).

### *3.2 Former research*

Some of the former researches describe the human language as a kind of psychological marker; it seems possible to find changes in language while lying in comparison with the word use while telling the truth (Pennebaker, Mehl & Niederhoffer, 2003). In addition to that there is more specifically information about the use of first-person singular pronouns while trying to deceive the recipient. It was found out that the frequency of these pronouns decreases while people are lying because people want to distance themselves from the made-up context (Skillicorn and Little, 2010). Furthermore the use of words while being honest or dishonest can be counted and later analyzed via the use of statistical programs.

As depicted in the script of Skillicorn and Little (2010), there is an increase of excitement and language errors present whenever people deceive. In addition, people often tend to “overthink” during the act of lying (Skillicorn & Little, 2010). It is outlined, that liars try to present themselves through performances which they think others value as authentic, for example being pleasant and positive (Lawson, Stedmon, Zhang, Eubanks & Frumkin, 2011).

Because that demands great mental and cognitive resources, liars have to be very much in control of their self-expression (Lawson et al., 2013). Being busy to control their self-expression liars have to focus on different behaviors. They have to control their body language and their spoken language.

Hartwig, Granhag, and Strömwall (2007) as cited in Warmelink, Vrij, Mann, Jundi and Granhag (2012) found out that liars often focus on the details of a story they tell specifically as they answer expected questions in contrast of truth-telling people. With regards to that, the use of a language while being dishonest will be focused on.

Officially there are three word categories that are prevalent while deception takes place: pronouns, emotional words and words which point out the cognitive complexity (Knapp et al., 1974 as cited in Pennebaker, Mehl & Niederhoffer, 2003). Furthermore humans have the affinity to tell true stories in a more personal and complex way than liars would do, thus telling a true story causes an increase of self-references while telling it (Chung & Pennebaker, 2007). Liars in contrast use fewer first person singular pronouns “I”, “me”, “mine”, because they dissociate themselves from the lie (Newman et al., 2003).

But there is also a demographic variable which influences the use of words during a speech (Pennebaker, Mehl & Niederhoffer, 2003). In their review, they mentioned that people of higher age tend to use more positive emotion words and more future tense words. In contrast they use fewer past tense, negative emotional words and first-person singular pronouns. As an explanation for this occurrence they named the gain of cognitive complexity which people normally reach in age. This demographic variable is noticeable but in this research it is not given any focus on this phenomenon. The variable is mentioned only to legitimate the choice of the participants used in this research.

In this research the focus will lie on the frequency of first-person singular pronouns people use while being dishonest. The groundwork research of this has been done by Newman and Pennebaker (2003) which will be explained in the following.

### *3.3 Effects of lying on language*

Based on the effects lying can have on changes in language, for example changes in the use of first-person singular pronouns, third-person singular pronouns and negative emotional words, Newman, Pennebaker, Berry & Richards (2003) conducted research about exactly this group of words. They did five studies on deceptive communication styles and they found out that the word groups of first-person singular pronouns such as “I”, “my”, “mine” and third-person pronouns such as “she, their, them” were used much less while deceptive communication took place. Whereas negative emotional words such as “hate, worthless, enemy” are used much more as well as motion words such as “walk, move, go”. In one of their counterbalanced study about the use of self-references while being dishonest, both men introduced the participants to give a true and a false characterization of people they truly like and do not like (Newman and Pennebaker et al., 2003). After that they analyzed the word category, the participants used.

All of their five studies named above, offer a lot of information about the use of words during deceptive behavior. Specifically the fact that people`s use of self-references decreases while lying, will serve a groundwork for this research paper in which it is tested if the presence of a mirror could have an effect on the use of first-person singular pronouns while a person is lying.

This research is conducted in a similar fashion based on their research design. The focus in this study will only lie on people`s use of first-person singular pronouns that changes when deceiving because of practical and economical matters. An example for this might be the detection of lies in a real situation like an interrogative setting, a forensic one or a law-enforcement (Sillikorn and Little, 2010). Another reason for focusing only on the use of peoples self-references is because of that it is known that the use of first-person singular pronouns indicates that people are being honest with themselves and so it seems

that by analyzing the use of this word category can bring up a valid and reliable measurement (Newman and Pennebaker et al., 2003).

It is important to say that people's self-perception is also assumed to have a great influence on the use of words while lying which now puts the use of the mirror into focus. This connection will be described in the following.

### *3.4 Dishonesty and self-perception*

As people tell stories about themselves or their own experiences, these stories often reflect the view people have of themselves. They can be seen as stories about who those people really are (Pennebaker et al., 2003).

It is interesting that people, who have acted immorally or in any way not according to society's norms, struggle to keep their self-perception positive in a moral way. This struggle becomes gradually more difficult, the more severe the action of the person has been. For example stealing a pen at the workplace might still be possible to reconcile with one's consciousness, because "everybody does it", while stealing money is disproportionately more difficult to legitimate to one's own mind.

This phenomenon was elaborated on in the research from Mazar et al., (2008) where she focused on "the proposed theory of self-concept maintenance" that "posits that people typically engage in dishonest behavior and achieve external benefits from dishonesty, but only to the extent that their dishonest acts allow them to maintain a positive view of themselves in terms of being honest" (Mazar et al., 2008, p.3). Drawn to the point of deception, people are able to lie as long as they keep their positive self-perception upright (Mazar et al., 2008).

In the context of lying it can be suggested that there is a way to change people's behavior of being honest or dishonest by influencing their self-perception by making them more self-aware. An increase of self-awareness could change the perception that people

have of themselves. The change of self-perception by increasing people's self-awareness should therefore, as a consequence, result in a different use of words while being dishonest because people who are more self-aware of their self-concept may be more likely to dissociate themselves from a lie to uphold their positive self-concept. In the following the concept of self-awareness will be explained further.

### 3.5 Self-awareness

Self-awareness can be described as a state of mind in which a person is capable of seeing herself as the centre of her own attention. Self-awareness comes into being when a person focus on her internal ambience and gets a sort of "reflective observer" (Morin, 2006). In that case people become aware of their mental conditions, mental experiences, and behaviors. Being self-aware gives human beings the possibility to switch attention between their environment and themselves. It seems that there are two ways of focusing on the self; a private angle of the self which means the ability to be aware about ones private self-concept and the internal states including feelings, thoughts, emotions etcetera. The public angle of the self means the ability to being aware of one's public extent of the self such as visible behavior or physical changes (Govern & Marsch, 2001).

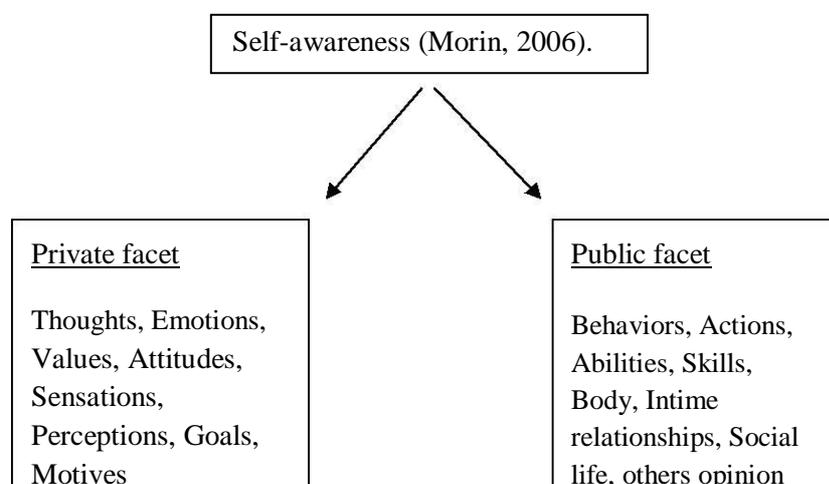
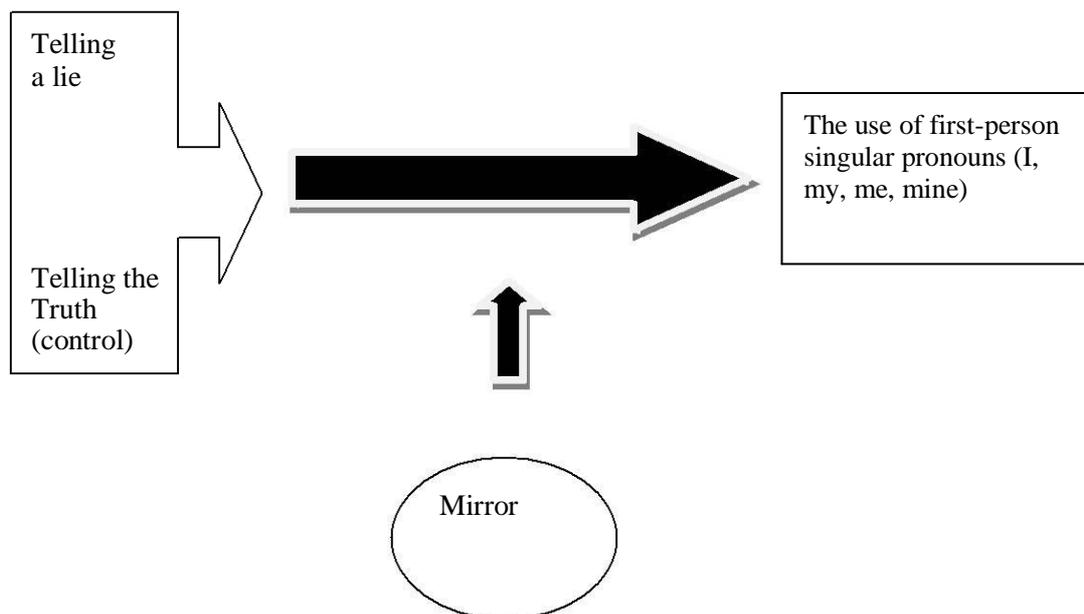


Fig. 1. Facets of self-awareness.

In this research paper one focus will be on influencing people's self-perception by manipulating the private self-awareness of the participants by the use of a small mirror in which the participants' can see their faces and their shoulders. Govern and Marsch (2001) as cited by Webb et al. (1989) used a small mirror, in which the participants could only see their head and shoulders, to influence people's private self-awareness thus peoples' feelings and their private thoughts. According to Buss (1980) as cited in Govern and Marsch (2001), a state of private self-awareness attends to define and fortify unconscious motives and private values so that private aspects of the self increase. People's behavior will reflect the increased mindfulness to these aspects. In general self-awareness can be activated through the use of objects like small mirrors, huge mirrors or cameras. But only a small mirror in which the participant only see close ups of themselves are used to influence the private form of self-awareness (Govern and Marsch, 2001).

Based on this, in this research also a mirror is used to influence the private self-awareness of the participants. This study will focus on manipulating self-awareness, to observe an effect on the use of words while lying. It is the purpose of this study to monitor the words subjects use while lying; as their self-awareness is being manipulated by putting a mirror in front of them. It is predicted that lying into a mirror creates a conflict inside subjects. While seeing someone's own face in a mirror while lying can make it difficult to keep peoples positive self-concept up. Accordingly these subjects will be more in favor of dissociating oneself from the lie so that there could be an effect of the mirror on the language people use during lying. To explore this prediction the following hypothesis is constructed:

*H1: The use of first-personal singular pronouns decreases, when people are lying, compared to when people are telling the truth and this effect will be reinforced by the presence of a mirror as opposed to when a mirror is absent.*



*Fig. 2. Conceptual model of the hypothesis.*

## 4 Methods

### *4.1 Participants*

The participants were randomly selected and participated from October to November 2014. The pool of participants consisted of 31 men and 57 women with an average age of ( $M=22.34$ ). In total 88 people participated. They were divided in two groups consisting of 44 participants each. Some of the participants' were students from Psychology and Communication Science. They received partial study credits for being a participant. People with dyslexia and eye-problems were excluded from the research.

Because of the demographic variable named earlier in paragraph 3.2, only people of younger age were selected to participate in this research. This was done in order to know if people of younger age also use fewer first personal-singular pronouns while lying as it was observed by people of higher age.

## 4.2 Design

The design in this research was a 2 (Lying (yes or no)) x 2 (Mirror (absent or present)) x <sup>1</sup> mixed design. The independent variables are firstly, the “mirror absent / present”, as a between-subjects variable. This mirror was a moderator and will therefore be called “Mirror” to reduce any confusion. In the condition where the Mirror was present, a longish Mirror is located in front of the participant, under the desktop of the computer so that they can see their head and shoulders while acting on the computer. The Mirror under the desktop is not present at the setting when the Mirror absent condition took part on the experiment.

The second independent variable was “Truth / Lie”, as a within-subjects variable. In the truth condition, participants were asked to write a true text. In the lying condition they were asked to write a make-up story. The order of these conditions was counterbalanced. The dependent variable in this research was the use of first-person singular pronouns (“I”, “me” and “mine”) (Newman et al., 2003).

Further, the experiment included a moderator analysis. There were two variables that may work together. The first variable was a continuous predictor variable and the continuous outcome variable. These two variables were moderated by the Mirror. The languages used during the experiment were English, Dutch and German which accordingly included first-person singular pronouns as following (“Ich”, “mir”, “mich”, “mein(e)” and “Ik”, “mij”, “mijn”). In this research paper, the focus lied on the effect of the independent variables.

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<sup>1</sup> The covariate “high/low self-monitoring” which could have had influence on the results; cronbach`s alfa = 0.684. The covariate was not relevant to this research but it still existed because the design which is also used to test the covariate was tested by another researcher as a fully-fledged variable.



*Fig. 3. Experimental room for the Mirror present condition*

#### *4.3 Material*

During the experiment the following materials were used: One sheet of paper including the information regarding the ‘Informed Consent’ (Appendix A), the main experiment (Appendix B), a questionnaire about self-monitoring via thesis tools (Appendix C), the Mirror (Appendix D) and a pen and a blank sheet of paper on which participants took notes.

The informed consent began with the title of the research as well as all contact information of the researchers. Furthermore, it included the goal of the research, its duration, instructions about what they had to expect and also information about their privacy protection.

The main experiment consisted of two conditions, namely the absence and presence of the Mirror. Both conditions consisted of four categories. In all categories the participants had to write a true-story and a made-up story. The order of the stories was counterbalanced as it is mentioned above. To mention the covariate, a questionnaire about self-monitoring was given to the participants via thesis tools at the end of the research. It consisted of 25 questions and was divided into five questions per page. At the end the questionnaire contains six more questions regarding the respective feelings of the participants while telling a lie and feelings

about lying in general. The questionnaire had to be answered on a five point Likert Scale.

For the research, one to three computers were available per day. The computers were placed in a one-person room that was sparse of stimuli, so that there was no distraction during the experiment. There was just one session which the participants had to attend. To gather the information, Thesis-Tools was used.

#### *4.4 Procedure*

After the participant's were informed about the procedure by the 'Informed Consent' and admitted to participate by signing, the participants took part in the experiment.

In order to prevent a copy-paste situation, two different contexts were created in every condition so that the participants had to put oneself in different situations. For one subject the participants were asked to imagine that they repeatedly missed the obligatory workgroup. Because of that happening their course of study was in danger and they could not take part anymore. For the second subject, they had to tell their friends that they could not go on holiday with them because of a very important event.

The only difference between the instructions was that the participants, who had to tell a true story, received a broad plot from which they had to formulate a convincing story. Participants who had to lie received a frame where the initial point of the plot was that they were out the night before and forgot to set the alarm. The task was to make up a believable story which distracted from their fault.

In the study, there were four alternative conditions. The selection occurred randomly. The presence and absence of the Mirror formed two conditions. In those conditions, the order of telling the truth or a lie changed. The variable "Truth/ Lie" formed the other two conditions. In each mirror absent/ present condition, they had to recall the event described above. After one minute of preparation they had seven minutes to write the text. When the

time was up the participants had a one-minute break before starting the second trail. This time, the procedure was the same as in the previous run: they had one minute to prepare themselves and again seven minutes for the second text. After finishing the tasks, they were asked to fill in the Self-Monitoring Scale. To fill in the test, they needed approximately about two minutes. Due to the fact that no pretest was constructed the first seven participants were used as sort of pretest group.

#### *4.5 Analysis*

To be able to focus on the special groups of words which were characteristic for lying, a program developed by Pennebaker, Francis and Booth (2001) called Language Inquiry and Word Count (LIWC) was employed. LIWC helped to analyze texts by counting words. In this program, the words were organized in dimensions and categories, ranging from “general” to “specific” (Pennebaker & King, 1999). The researcher chose which category finally had to be used. In this research the relevant category was the category of ‘first-person singular pronouns’. After counting the words of the relevant category, LIWC gave the percentage of each word and how frequently it was used. This list could be exported in SPSS (Pennebaker et al., 2007).

As it was mentioned earlier in this paper, the covariate “self-monitoring” was included in the analysis but it stayed out of focus. The dependent variable was the frequency of the use of first-person singular pronouns. The independent variables were the “Mirror absent/ present” and “Truth/ Lie”. Further, the focus lied on the attitude towards lying and the use of first-person singular pronounce on basis of the additional questions at the end.

First, to enable an analysis, the 25 answers belonging to the Self-Monitoring Scale were reduced to one variable. This variable was the mean of all answers for each person. Second, a new variable needed for the difference between the usages of “self-references in the lied text” (SRL) and the “self-references in the true text” (SRT) was created. To get

this variable, the proportion of self-references in the true text (SRTPercent) as well as the proportion of self-references in the lied text (SRLPercent) were estimated and from each other subtracted (SRTPercent- SRLPercent).

For the secondary analysis, ANOVA was used to discover a possible correlation between the participant's attitude towards their daily use of lies, lying in general and in this study, and their difficulties with writing in lie per se and in contrast to the true story, and their lying attitude defined by the use of self-references. Further, there was an additional question about the true story which aims at the origin, whether it was based on an experience or fictional as well as the lied story. To make the difference between the lied and the true text more clear and realistic, those participants who wrote a fictional story twice, were excluded. With the new dataset, the primary analysis was repeated.

## 5 Results

To determine the main effects of the Mirror on the frequency of self-references the "SPSS Marco for Probing Interactions in OLS and Logistic Regression" (Hayes and Matthes, 2009) is conducted as primary analysis. Before taking this analysis out, the dataset of the variable "SRTPercent" ( $M= 11, 0234$ ,  $SD= 4, 04775$ ) and the dataset from the variable "SRLPercent" ( $M=11,5576$ ,  $SD=3,55049$ ) were created by a paired sample t- test. To extract this variable (SRTPercent- SRLPercent), the independent variable "self- references in the lied texts" (SRT) is subtracted from the variable "self-references in the true texts" (SRL).

After that the primary analysis named earlier is carried out to spot on the main effects the different conditions "Lying/Truth" and the "Mirror absent/ present" have one the number of self-references people use while lying. This regression analysis yields no significant main effect concerning the factor Lying/ Truth  $B= -0.0053$ ,  $t(88) = -1.4396$ , and no main effect of the factor Mirror absent/ present  $B = 0.0120$ ,  $t(88) = 0.7151$ , not

significant. The procedure is used to analyze if the presence or absence of the Mirror increases self-awareness in the way that the manipulation has an effect on the use of self-references people use while lying or telling the truth.

Because there are no significant effects in the first analysis a secondary analysis is carried out. Therefore a Multivariate ANOVA is used. The Independent and dependent variable(s) stay the same. It is known that the covariate “Self- Monitoring” stays out of focus until now. In the following the covariate will be mentioned once because it is noticeable that the secondary analysis yields a significant multivariate main effect of the mean of the self-monitoring (SMmean)  $F(5, 80) = 3.769, p = .004$ ; Wilk’s Lambda = 0.809, and this legitimates to have a closer look on the univariate ANOVA analysis regarding the (SMmean).

The univariate effect shows a significant main effect impacted on the control question “*I had difficulties to think of and write down the lied story*”  $F(1, 44) = 7.885, p = .006$ , ( $M = 2.65, SD = 1.185$ ) concerning to the variable Mirror present/ absent. The second significant main effect can be detected for the control question “*I had a bad conscience while writing the lied text*”  $F(1, 44) = 4.312, p = 0.041$ , ( $M = 2.30, SD = 1.186$ ) concerning the variable Mirror present/ absent. The third significant main effect can be noticed for the control question “*in everyday life, I do not lie often*”  $F(1, 44) = 7.934, p = .006$ , ( $M = 3.85, SD = 0.953$ ) concerning the variable Mirror present/ absent.

### 5.1 Additional analysis

To have a final look on the effects it is meaningful to eliminate further errors which can have an influence on the results. Because it is certain that some participants who answer the final question of the study “*did you use a memory of yours for the text where you have to tell the truth*”, with “No”, it is necessary to eliminate their data from the official dataset to minimize the error rate. Because of that, the following analysis is a replication of the first request in

the beginning of the result section. The same analysis is taken out for a second time with a corrected dataset. It becomes apparent that there are also no significant effects from the respective conditions,  $B = -0.0019$ ,  $t(40) = -0.3552$ , not significant and even no main effect concerning the Mirror  $B = -0.0337$ ,  $t(40) = -0.3393$ , not significant is visible after testing with the “SPSS Marco for Probing Interactions in OLS and Logistic Regression” (Hayes and Matthes, 2009, Probing interaction procedures, SPSS output, p3) again. After carrying out another secondary analysis with a multivariate ANOVA becomes apparent that there are no further significant effects concerning the Mirror and the control questions “*I had difficulties to think of and write down the lied story*” ( $F(5, 32) = 1.579$ ,  $p = .217$ ), not significant, and “*I had a bad conscience while writing the lied text*” ( $F(5, 32) = 0.906$ ,  $p = .906$ ), not significant. For the third control question “*in everyday life, I do not lie often*” there are a minimal significant effect the presence of a Mirror had on it ( $F(5, 32) = 4.263$ ,  $p = .046$ ).

## 6 Discussion

This experiment was designed to test what kind of effect an increase of private self-awareness by the presence of a mirror had, on the self-references people use when lying. Specifically it was tested, if the use of self-references decreases, when people were lying, compared to when people are telling the truth, and whether this effect was reinforced by an increase of self-awareness through the presence of a mirror as opposed to when a mirror was absent. By using a mirror as moderator, the participant's private self-awareness should have been increased.

Referring to the data of this study, it turned out that there were no significant results concerning a relationship between self-awareness and the use of first-person singular pronouns while lying and also no significant effects concerning the conditions “Lying/Truth” and “mirror present/ absent”.

One difference between former studies and this experiment was that in the actual study only the use of first-person singular pronouns were tested. In former studies the focus laid on more word categories to detect liars. However, the results of this research were not in line with former research. It did not come out that liars use fewer self-references while lying than while telling the truth. In the following attempts will be made to explain why the hypothesized effect of a mirror - to decrease self-references while lying – could not be found in this experiment. At first the theoretical concept on which the research is based on has to be inspected.

First, it was known from the research by Newman and Pennebaker et al. (2003) on the use of first-person singular pronouns, that deception leads to a decrease in the word use of self-references. In the present study this effect was not found.

There are several factors that could have influenced the use of first-person singular pronouns. For example, demographics such as gender had an enormous influence on the use of first-person singular pronouns. According to them, females use these pronouns much more often than males do. In this study the number of females was higher (57) than the number of males (31). However, the responses of the female participants had no greater influence on the significance of this research.

Another demographic factor was the age of the participants as it was mentioned in paragraph 3.2 and 4.1. It came out that younger people did not use fewer first-person singular pronouns while lying as older people did which was known from former research described in paragraph 3.2.

A further point which should be mentioned is the influence culture can have on the use of first-person singular pronouns. For example, third-person pronouns are frequently more common in collectivistic cultures and first-person singular pronouns are more common in individualistic cultures (Chunk and Pennebaker, 2007). It has to be taken into consideration that in this study the majority of the participants was from individualistic cultures such as

the Netherlands and Germany. Knowing that, focusing on the effect of self-references people use while lying seemed to be a good choice. But there were two ways it could be going. Firstly, the mirror could have had influenced people's language in a way so that people were willing to perform their lie as well as possible. In that case the mirror would increase their motivation of telling a convincing lie in a competitive way. It could be possible that people who saw themselves in a competitive situation were more likely to use frequently more self-references as they lied. But to insinuate this, it has to be tested if that assumption could be true. Until now it is commonly believed that liars are likely to tell more detailed stories to be a convincing liar (Warmelink et al., 2012). However, to minimize this sort of error it could be possible to mention that there is no competitive situation wanted.

Secondly, lying into a mirror makes it difficult to keep people's positive self-concept up. That implied that as people are more likely to use self-references in general they will reduce them to be convincing liars and to stay separated from their lie. In the following the focus will stay on the state of self-awareness and its possible influence on people's use of self-references while lying.

As it has been written in the research by Govern et al. (2001) as cited by Webb et al. (1989) a small mirror, in which the participants can only see their head and shoulders, can be used to influence people's private self-awareness and thus people's feelings and their private thoughts. It was predicted that a greater private self-awareness created by the presence of a mirror would decrease the self-references people used when lying. It had to be said that the mirror, according to the accumulated data, had no effect on the use of self-references.

It is to mention that there was no measurement in this study which controlled the state of private self-awareness from the participants in the mirror present/ absent condition. The

people's attitude towards their private self-awareness was not checked. Connecting up to that the concept of self-awareness in this study will be discussed next.

The results showed that a manipulation of self-awareness had to be more extensive than it was. In this research only a mirror was used to increase that special state of mind but there was no control instrument used to check on the participant's state of self-awareness. Maybe the mirror did not increase the private self-awareness of the 44 participants that crucially to get any effect on the people's self-references in the "mirror present" condition. To be aware of an increased private self-awareness, a questionnaire could have been used to check the participant's state of private self-awareness after participation so as it was done by Govern and Marsch (2001). The researchers used a Situational Self-Awareness Scale (SSAS) to measure the two facets of self-awareness, the private and the public one.

Other possible explanations for the fact that there were no significant effects found might be that the mirror only increased private self-awareness but has no influence on people's self-perception. Or not only private self-awareness but also public self-awareness is a part of people's self-perception. So it might be possible that if both facets of self-awareness had been influenced, there would have been an effect on the use of self-references present, due to both facets having an influence on holding up a positive self-concept. To explain the possible influence private, and public self-awareness can have on people's self-concept, a closer look on the study from Govern and Marsch (2001) can be taken.

According to them public self-awareness let people see themselves as subject of other people. Self-awareness as a whole state of mind, consisting of these components, is a kind of a control instance which wants to minimize self-standard discrepancies based on the self-reflexive quality of people's consciousness (Duval & Wicklund, 1972), as cited in Silvia and Duval (2001). Specifically, it could have been possible that a greater

discrepancy of own standards, by influencing both facets of self-awareness, could have had influenced the positive self-perception of the participants. Maybe this could have triggered the predicted changes in their use of language.

In addition, maybe there was no significant effect noticeable because the effect of the small sample size of 88 participants and thus because of the test design, which will be explained later.

In the following some possible pitfalls of the test design will be discussed. These “pitfalls” can be subcategorized into flaws occurring in the actual test design and errors made while conducting the experiment.

It could be mentioned that the sample size in this study was not comparable to the one found by Newman and Pennebaker et al. (2003) whose research served as a scaffolding for this study, and this may be a reason why this study did not yield similar results.

The question now is, if the method to manipulate self-awareness in this experiment was somehow flawed and spoiled the results. It might be possible that the mirror did not have a good position so that not everybody could have seen their faces and shoulders because of different heights. So it might be that some participants missed seeing their reflection. Another point might be that the mirror was not small enough because a longish mirror was used for this experiment, as can be seen in the Appendix D. Because of this, the participants saw not only their faces and shoulders but also some space in the room behind them. Maybe this could have lead to a distraction from their reflection.

Closely connected to this mirror-issue and probably of a high importance could be the following remark, which was uttered by numerous participants. It was often reported by the participants that they could not remember the mirror in front of them when it was present. These statements can be regarded as somewhat satisfying for the researcher because observation of the participants showed that each participant who claimed that he/she had not recognized the Mirror had looked at it in the beginning to correct their haircut

or make-up. Thus, unconsciously, they recognized a mirror for sure. While on the one hand this was desirable, because the mirror obviously did not make the participants feel uncomfortable, this could, on the other hand, be a lead proving that the influence of the Mirror on the participants was indeed minimal and did, as a consequence, not achieve the desired effect.

After having looked at the possible sources for errors in the test design, a closer look will be now taken on possible sources for errors in the actual testing process.

Due to the fact that the researcher talked to the participants about what they thought of the experiment and its progress afterwards, some methodological complexities came up. The participants told the researcher that they found the instructions for writing a made-up text much easier to understand than the instruction for the true text. For some participants the instructions of the “telling the truth” part seemed not clear enough. Some participants said that they had to make-up a story in both conditions; in the lie condition and in the true condition. To prevent the participants from making that mistake the instructions were originally filled with sentences like “Remember a situation where you have been late for an appointment. Use this memory!” to make clear that they have to tell a true story out of their own life to justify their actions in the experiment. To prevent this, those explanatory sentences could be highlighted to make sure that this mistake does not occur again.

This is closely linked to the fact that the participants did not read the instructions as clearly as was hoped for. The instructions include an advice to write the texts in the mother tongue of each participant because writing in the mother tongue minimizes misspelling. To be able to analyze all the texts participants had written in their mother tongue, the LIWC program was chosen to count the important words needed to test the hypothesis. Unfortunately, some participants did not read the instructions well and started writing in English. Some of them noticed the mistake and were motivated to start again in their mother tongue. Because it is not known how many participants made this mistake, it is

possible that there are some misspellings in the texts that prevented the LIWC from counting the right words and therefore interfered with the analysis. Surely, that could have an influence on the results, because words are missing. For the following research it might turn out helpful to check the participant`s correct understanding of the instructions after they have read the instructions, but before they start with their task. A simple way of doing so would be to let them sum the instructions up in their own words.

Another problem which could have lead to a loss of data was that at one moment the internet did not work anymore so that the experiment stopped at this point. The problem appeared once and the participant was motivated to participate in one more session. For the next time it would be advantageous to have the possibility to back up all steps the participant does immediately and automatically so that in case the internet brakes down, the participant can continue where he had stopped when the internet works again.

At this point it is wise to mention that an extensive pretest could have reduced the mentioned sources of error to a minimum. Before starting the experiment it was clear that a pretest group was desirable and beneficial for a lower error rate. If the study had been estimated over a longer period of time and if there were more participants available a pretest would have been carried out. Surely, in case of extreme promotion an extensive pretest could have had also taken place in this study. During this experiment only the first seven participants were used as a pretest group. Errors in structure, spelling and comprehension, which came up during their participation, were eliminated and upgraded before the definite experiment started.

Furthermore it is important to mention that taking out an additional analysis led to a loss of explanatory power. So in general a much greater sample size is necessary to work with such a correction in the analyze model.

For following studies, the research design has to be adapted and upgraded in the points mentioned above.

In conclusion this experiment was set up to manipulate self-awareness in the way of getting an effect on people's use of self-references when lying compared to when they tell the truth. Former research has generally focused either on the use of self-references while lying (Newman & Pennebaker et al., 2003), or how self-awareness helps to detect deception in a valid way (Johnson, Barnacz, Constantino, Triano, Shackelford & Keenan, 2004). The actual study focused on the prediction that a manipulation of private self-awareness through the use of a mirror could have an effect on the use of self-references while lying. In a practical matter that could be helpful to detect liars in court or forensic institutions.

A significant effect was not found concerning a relationship between a decrease in self-awareness and a decrease of first-person singular pronouns while lying. Liars did not use fewer first-personal singular pronouns when they were part of the mirror present condition. The presence of the mirror had no reinforcing effect on the use of first-person singular pronouns.

The actual result suggests that further research can be done to understand the effects of a manipulation of self-awareness, the public self-awareness and the private self-awareness, on the use of self-references. Maybe therefore more instruments than a mirror could be used, for example cameras or the presence of witnesses and a mirror. To check if self-awareness will be influenced crucially, a questionnaire can be a good measurement of choice.

Perhaps for further research it is also good to establish on a possible relation between self-awareness and the concept of self-monitoring.

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## 8 Appendix

(A)

### *Informed Consent*

Titel: Criminal Minds\_–\_Be convincing

Researchers:

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Dear participant,

The goal of this research is to collect more information over how convincing people are. If you decide to attend this study, it will take about half an hour to participate. In the beginning, you will be asked to give some demographic information about your person (age and gender). Further, the task is to write two texts according to the given instructions. Those instructions contain the demand to either tell the truth or lie about a subject that you will receive through the instructions. All other necessary information will be also given to you by the instructions. So, read them carefully. It is important that you write the texts in your mother language.

In the end, you are asked to fill in a questionnaire and give some feedback. When you have finished the study, please call for the researcher.

This research is anonymous. That means that the data will not be linked to a name and only be seen by the researchers and Peter de Vries, the head of this research. In addition, your attendance is voluntary and you can stop at any time during the study. If you have any complaints about the research, or in case of discomfort about this research you can contact the Commission of Ethics of the faculty behavioral science of the University of Twente:

Commissie Ethiek Faculteit Gedragwetenschappen Universiteit Twente  
Postbus 217

7500 AE Enschede

Tel: 053 – 4894591

E-mail: [j.rademaker@utwente.nl](mailto:j.rademaker@utwente.nl)

For further information, you can contact us or Peter de Vries ( [p.w.devries@utwente.nl](mailto:p.w.devries@utwente.nl)).

Katharina and Katharina

I am sufficiently informed about the research.

Name of Participant/Signature

.....

I am willing to answer further questions about the research as far as it is possible for me.

Name of Researcher/Signature

.....

(B)

Thank you for deciding to participate in this study!

First, you will be asked to write **two different texts**. For each text, you have **8 minutes**; 1 minute is scheduled for preparation. If you want to make notes, you may use the paper and the pen lying on the table. In the following 7 minutes, you have time to write the text.

When you have finished the two texts, you will be asked a **questionnaire** containing 25 questions in form of statements. In the end, we will ask you to give some feedback.

For further instructions and to start with the tasks, press '**Next**'.

Instructions for the tasks:

You will get instructions for the plot of the text before you may start writing. Read those instructions carefully. They differ from each other.

Even if the instructions are in English, please write those texts in your **first language**. It is important that you project your thoughts in these situations. This is easier to do in your native language.

Also, please pay attention to the countdown on each page to be able to finish in time. If you are ready before the time is up, press 'Next' to continue (you do not have to wait).

Press '**Next**' to start with the first text.

The first task:

Project your thoughts in this situation:

You had some experiences that cause that you hate being late. Today, you have an appointment with a friend of yours. Unfortunately, you leave home late and therefore you

have to hurry to be at your friend's place in time. You took the bike to get there. On your way, you drove through a red light. Unfortunately, the police stood around the corner hiding to catch traffic offenders.

Now, tell the police why you drove through a red light. If they do not believe you, you have to pay 100 Euro. So, you have to tell the **truth** about what could have been YOUR reason why you hate being late. Remember a situation where you have been late for an appointment. Use this memory! Write the story in a descriptive and convincing manner. Pay attention to the grammar, spelling and time.

Please, write about 200 words.

The second task:

Project your thoughts in this situation:

You repeatedly miss the obligatory workgroup of your study. Last time you missed class, the tutor, Mr. Smith, warned that you were not allowed to continue the course anymore, in case you would miss it again.

This morning, you wanted to go to that class. However, last night, you went out and had a really good time. You came home late and forgot to set the alarm. You woke up 15 minutes after the class started, therefore you did not manage to attend this class anymore.

Now, you have to write an email to Mr. Smith. Because the course of your study depends on this class, you have to think of a credible story that could have happened to YOU that morning (**lie**). It is obvious that you cannot tell the truth. **Lie** about what this story could be in a descriptive and convincing manner. Pay attention to the grammar, spelling and time.

Please, write about 200 words.

### (C) Self- Monitoring Questionnaire

I find it hard to imitate the behavior of other people.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

My behavior is usually an expression of my true inner feelings, attitudes, and beliefs.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

At parties and social gatherings, I do not attempt to do or say things that others will like.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I can only argue for ideas which I already believe.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I can make impromptu speeches even on topics about which I have almost no information.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I guess I put on a show to impress or entertain people.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree

- I totally disagree

When I am uncertain how to act in a social situation, I look to the behavior of others for cues.

- I totally agree  
 I agree  
 I do not agree or disagree  
 I disagree  
 I totally disagree

I would probably make a good actor.

- I totally agree  
 I agree  
 I do not agree or disagree  
 I disagree  
 I totally disagree

I rarely seek the advice of my friends to choose movies, books, or music.

- I totally agree  
 I agree  
 I do not agree or disagree  
 I disagree  
 I totally disagree

I sometimes appear to others to be experiencing deeper emotions than I actually am.

- I totally agree  
 I agree  
 I do not agree or disagree  
 I disagree  
 I totally disagree

I laugh more when I watch a comedy with others than when alone.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

In groups of people, I am rarely the center of attention.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

In different situations and with different people, I often act like very different persons.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I am not particularly good at making other people like me.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

Even if I am not enjoying myself, I often pretend to be having a good time.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I'm not always the person I appear to be.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I would not change my opinions (or the way I do things) in order to please someone else or win their favor.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I have considered being an entertainer.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

In order to get along and be liked, I tend to be what people expect me to be rather than anything else.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I have never been good at games like charades or improvisational acting.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree

- I totally disagree

I have trouble changing my behavior to suit different people and different situations.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

At a party, I let others keep the jokes and stories going.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I feel a bit awkward in company and do not show up quite as well as I should.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I can look anyone in the eye and tell a lie with a straight face (if for a right end).

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I may deceive people by being friendly when I really dislike them.

- I totally agree

- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

#### Controle Questions

In this study, it took longer to think of the lied story than of the true story.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I had difficulties to think of and write down the lied story.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

I had a bad conscience while writing the lied text.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

In everyday life, small lies are justifiable.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree

- I totally disagree

In everyday life, I do not lie often.

- I totally agree
- I agree
- I do not agree or disagree
- I disagree
- I totally disagree

Last question:

About the true text:

Did you use a memory of yours for the text where you had to tell the truth?

- Yes

(D) Mirror condition

