ERASMUS UNIVERSITY ROTTERDAM

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Master Thesis Behavioural Economics

Lie Detection and Social Conformity: A Culture-Sensitive Study

How social conformity interacts with our individual propensity to lie in social situations

Name student: Rachele Ciulli

Student ID number: 480995rc

Supervisor: Professor Sophie van der Zee

Second assessor: Professor Jan Stoop

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Abstract

One of the specific traits of the human species is the ability to manipulate others to benefit from it. Deception and manipulation are considered negatively by the majority of the cultures but in reality, everyone experiences mendacity to some extent, especially when interacting in social situations with others. This study focuses on deception in a social context, when the individual keeps his true opinion private in order to comply with the one shared by the group. The experiment tested whether social conformity operationalized through social approval score and cultural background, affects the individual's tendency to lie in social situations. To this end, participants were asked using vignettes (i.e., hypothetical situations) how likely they would have lied in that specific social situation. The situations described were manipulated in their context, meaning some factors were changed to foster a high social conformity or a neutral reaction. Secondly, because the experiment investigated also how the level of social conformity of the participants interacted with the cognitive effort necessary to lie, it also measured reaction times (i.e. how long it took participants to fill out the vignettes questions). The study's results demonstrated how the individual propensity to conform had a stronger influence on the tendency to lie of an individual, compared to his cultural level of social conformity. Therefore, the social approval score was used to split the subjects in low and high conformists. Afterwards, the analysis revealed how high conformist people were more inclined to lie in social situations compared to non-conformists, independently from the context of the social situation. In fact, the manipulation of the context to trigger social conformity did not play a role in how social conformity affected the subjects' tendency to lie. An analysis of the reaction times showed how the high conformist subjects were faster than low conformists in deciding with which probability they would have lied in a certain situation. These results showed how the propensity and desire to conform of each individual, being a strong and personal characteristic, is able to influence his tendency to lie and the intensity of cognitive effort necessary to lie. Adding important insights to the discussion on the cultural influence of dishonesty on individual deception, the study showed how external factors as the cultural background of the subjects and the context of the social situations in which they interacted did not play a role in the influence.

1. Introduction

Research fields like decision sciences, social psychology and behavioural economics, all study how people's instinct to cooperate in social interactions affects behaviours, social relations and economical decisions. The most recent line of thought identifies the factor that fostered humans enhanced brain's size in a high level of social intelligence, that allows them to acquire a great deal of knowledge from the others and manipulate them to their benefits (Alexander, 1974; Vrticka, 2013; Byrne & Whiten, 1989; Hermann et al., 2007; Reader & Laland, 2012).

The urge to create social networks, cooperate and receive social approval is so deeply rooted in human nature that their brains developed a mechanism of punishment and reward connected to the level of positivity of their social relationships and reciprocal altruism (Rilling et al., 2002). Indeed, the same areas of the brain respond both to physical rewards and punishments, like food and physical pain, and to social positive and negative stimuli. When a conformist behaviour is implemented the brain registers the social reward of being included and approved by the peers and reacts with a positive sensation (the same that food would provoke) while when the person experiences disapproval and exclusion (social punishment) the sensation is the same that the person would feel when in physical pain (Falk et al., 2012). Moreover, the ability to maintain a social network and to interact smoothly with the others allows the human organism to conserve energy, improving its health and longevity (Beckes & Coan, 2011).

Of course to conform and harmonize their relationships with the others, sometimes people have to suppress their true thoughts or filter them. For that reason, they developed mechanisms of deception, to smooth the social interactions and avoid possible conflicts (Bernheim, 1994). Deception and manipulation are terms with a negative connotation, usually associated with specific figures like politicians and bankers, famous for their cunningness. In reality, everyone experiences deception to some extent, especially when they interact with each other, to the point that deception can be considered a form of communication itself (Burgoon & Buller, 1994; Backbier & Terwogt-Kouwenhoven, 1997; Vrij & Mann, 2004). The ability to deceive the others is essential to maintain smooth relationships in society, as everyone that has ever restrain himself from giving their true opinion on the horrible pair of shoes of their friend already knows. White lies, or social lies, are an "innocent" form of deception, false statements

given in polite conversations to avoid discussions. Although lies are usually considered negatively by the society, this specific type of lies is accepted and encouraged (Backbier & Terwogt-Kouwenhoven, 1997). The more a society cares about social relations, basically the more conformist it is, and the more white lies will be considered acceptable.

In fact, each society is based on different values, influenced by historical and social developments, by the geographical position and the economic conditions of the population etc. This set of silent norms is part of the culture of a nation and dictates the rules of conduct, describing what is acceptable for that society and what is not. The members of the culture use them as a benchmark, guidelines that they can follow to be accepted and integrated by the others (Cialdini & Glodstein, 2004; Bernheim, 1994). The different values are of course highly interrelated with the way people in that culture behave, and the degree with which the members feel that they have to respect these non-written rules changes from culture to culture, along with their need to be accepted by others (Murray et al., 2011; Bond & Smith, 1996; Milgram 1961; Hofstede, 1983). The culture of a country influences to some extent the individual propensity to conform of its components, creating behavioural patterns across countries (Kim & Markus, 1999). Hence, individuals feel more or less the need to be approved by the others, a concept known as social conformity.

Social conformity was first investigated by Asch, in 1955, utilising some lines of different lengths and a group of actors (Asch, 1955). The experiment designed by Asch involved 8 participants at a time, 7 were confederates, and only one was the "real" subject unaware that the others were on the same board and instructed on what to respond to the experimenter's questions. The experimenter presented one card with three lines of different length and one card with a single line: the simple task to perform was to state which of the three lines presented on the first card was the same length of the one presented in the second card. When the confederates started to answer blatantly wrong to the question the unaware subject could conform to the group, knowing that the answer was wrong, or be the only one to give the right answer. In the first experiment the 76% of the participants decided to conform, against their better judgement. This kind of behaviour is known as social conformity and specifically, as theorized later by Cialdini and Goldstein, as compliance. Compliance is the act of hiding one's true inner opinions to conform to the public opinion expressed by the group (Cialdini & Glodstein, 2004). The instinct to conform to others was explained as the evolution's response

to the challenge of the nature, whether they be pathological menaces (Murray et al., 2011), reproductive necessities (Bernheim, 1994) or mere self-defence (Griskevicius et al., 2006).

Milgram exploited the results of the Asch's experiment, drawing the first link between social conformity and culture of the country that influenced the subjects, in this case comparing the French and the Norwegian culture. Using the same principle of Asch (some registered tones instead of lines), Milgram deceived the subjects by making them believe that there were many other people in the near cubicles. The task presented to the subjects was to listen to the tones and decide which one was longer. Once again, the naïve subject listened to the answers of the others before giving his own and he replied the same as the group did, even if he knew it was the wrong answer. The results of the experiment were compared to the culture of the subjects and the study showed how the French were actually less conformist than the Norwegian, having France a more individualistic culture than Norway (Milgram, 1961). Indeed, the individualistic culture of their country seemed to play a role in how much people conformed.

The Bond and Smith's meta-analysis study on conformity confirmed that there is a significant positive correlation between the Individualism of a nation and its low conformism, while the nations classified for their collectivistic culture are characterized by a higher level of social conformity (Bond & Smith, 1996). Hofstede's researches investigated in that direction, classifying the nations by four cultural dimensions: Power Distance, Uncertainty/Avoidance, Individualism and Masculinity (Hofstede, 1983). Therefore, subjects from nations with a collectivistic culture, like Greeks or Japanese, are expected to perform higher on tests that measure their tendency to conform, while subjects from Netherlands or Italy, with an individualistic culture, should perform lower.

Exploiting these results, this study aims to offer new insights about the relationship between social conformity and tendency to lie in social situations. Do conformist people tend to comply more using social lies, compared with less conformist ones? Since the culture of their country affects their level of social conformity, does it also play a role in affecting the tendency to use social lies?

This study aims to understand if the tendency to lie in a social context can be affected by the social conformity of the subjects. To which extent does the cultural background of the participants count when compared to their individual propensity to conform? What is the best

measure to capture the social conformity of the subjects, their individual or their cultural level of conformism? Based on the previous research, we hypothesize that the cultural background of people in terms of social conformity should play a role in their level of social conformity hence in their tendency to lie. In other terms, cultural background and individual social conformity should have a statistically significant correlation (H1a); if not, the cultural background should act as a moderator for the effect that individual social conformity has on the vignettes score (H1b); if not, we should choose one method to divide the sample, either the individual or the cultural social conformity: testing both, the best method is the one with the higher influence on the vignette scores (H1c). The social conformity level is captured first with an individual test that register the need of social approval for each subject. Then, the social conformity is considered from the cultural point of view, using a list of the countries for their level of individualism to match the culture of subjects. The more the subject's nation is individualistic the more his culture will be considered non-conformist.

To measure the tendency to lie in a set of different social contexts, the subjects have to respond to a set of hypothetical situations (i.e., vignettes), and are asked with which probability they would lie in such situations. To capture how the social norms present in a context implicitly affect the tendency to lie of the subjects, we manipulated the situation presented in the vignettes. Some factors like the familiarity of the subjects interacting in the vignettes, the way they communicated with each other and the status and authority they had, were changed in each vignette, to trigger the social conformity of the participants or to create a neutral context.

To measure how much at ease participants are with lying, we kept track of their response times when answering the vignette questions. If the tendency to lie is indeed affected by the level of social conformity, would that mean that high conformists, being more "used" to lie, are also faster than low conformists in dealing with social lies?

Previous research has demonstrated that the more someone has practiced lying behaviour, the more he is "used" to lie, and the faster he will be in lying (Van Bockstaele et al., 2012; Walczyk et al., 2005). If a high level of social conformity actually affects the tendency to use social lies, then the more someone is conformist the more he will be "used" to these type of deception, hence faster because more at ease in dealing with it. If that is true that would mean

that reaction times, a popular method to detect deception, would be shorter in people that conform more compared to people that conform less.

In the first chapter a theoretical background is presented to understand the context beneath the research questions. Then the experimental design and the procedure are presented, followed by the results. Finally, a chapter with the interpretation of the results and the limitations concludes the thesis.

1.1 Theoretical Background: Social Conformity and Deception

It seems clear that the differences in cultures across the countries imply also a difference in how much social relations are valued and how much the different societies push their members to care about social relations, meaning that people from different cultures will have different level of conformity. If deception is usually considered negative, but accepted to preserve social interactions, it means that the more the culture values social conformity and good social relations, the more the act of lying to conform will be considered acceptable. Hence, can deception be context dependent, meaning that it is affected by the environment and the external conditions, like the cultural values of the subject?

A very interesting branch of research focuses on dishonesty and how its levels could vary from country to country. Could a culture affect the dishonesty level of its members? This is a very controversial topic with research developed in both directions.

Mann and colleagues investigated the relationship between the level of corruption of five different countries and the general attitude of their habitants toward dishonesty (Mann et al., 2016), and found that the country's level of corruption dodid not affect the subjects' cheating behaviour in a lab setting, when a decontextualized task was given (a "neutral" task without a context). Schultz and Gächter replicated the study across 23 countries and found instead a pattern in how culture affected dishonesty (Gächter & Schulz, 2016). The study by Mann et al. hypothesized that the social norms implicitly communicated by the culture of the country where someone lived should affect the moral perception of dishonest behaviour. Hence, the less the culture of a country condemned dishonest practices, like corruption, the more the generalized dishonesty of its members, which is a specific personal trait and is part of the core set of values of an individual, should be high. To test this, Mann and colleagues presented the

subjects in their experiment with a task that offered the opportunity to cheat. They then compared the results with the nationality of the subjects and the corruption levels of their countries, looking for a correlation. Instead, they observed a similar dishonest behaviour across nationalities, meaning that the culture of the country had no significant effect on the cheating behaviour of the participants. Furthermore, the subjects tent to cheat just a little, not in a blatant way.

This last result seems in line with the theory of Self-Concept Maintenance previously elaborated by Mazar and colleagues in 2008. According to this theory, when people have the opportunity to cheat, they usually tend to do it only by a small amount: they want to profit from the situation but at the same time they need to maintain a good self-image of themselves to be able to look at themselves in the mirror. Therefore, they balance these two forces by "fudging", meaning they cunningly change some little details of the truth, shaping it in their favour or they act dishonestly just a bit, little enough to still feel good about themselves (Mazar et al., 2008).

However, Mann et al. did find a difference in cheating behaviour when they replicated the experiment with a group of people at a coffee shop (general public) instead of testing a group of students in a laboratory. People in the lab tent to be more dishonest than in the social environment where the others could observe them (Mann et al., 2016). This result together with the Self-Concept Maintenance theory suggests that the influence of culture on the dishonest behaviour of a population occurs through the social norms of that culture, which establish whether the dishonest behaviour is acceptable or not in each specific situation. This hypothesis would explain why an abstract task as the cheating one cannot capture the culture-dishonesty relation while a significant difference in that sense is found in situations where a specific act of dishonesty is performed in a specific context. Examples of dishonest behaviour affected by culture can be found in tax compliance (Andrighetto et al., 2016), avoiding tickets' payment (Fisman and Miguel, 2007), or bribing an officer (Barr and Serra, 2010), where, in contrary to lab studies, people from more corrupted countries do exhibit more dishonest behaviour. It seems that the decontextualized task fails because the influence of the culture on the cheating behaviour happens exactly through the context, specifically the social norms that the context contains. Therefore, social cues seem essential to trigger the dishonest behaviour. These cues differ between cultures, being dependent on social norms and which (dishonest)

behaviours are deemed acceptable. This hypothesis would also explain why the dishonest behaviour is higher in the students' group than in the coffee shop's group in the Mann et al.'s study: the public environment contained social cues that affected the subjects' behaviour.

Another study corroborating that social norms influence dishonesty when some situational factors are present investigates the influence of culture on tax evasion (Andrighetto et al., 2016), comparing in particular Sweden and Italy, countries that differ in level of corruption. The results show how many people from Italy, which is a highly corrupted nation, tend to "fudge" more, meaning they cheat only by a little amount. The Swedish, instead, present a more extreme behaviour, meaning they either cheat completely or they are completely honest: less people are cheating, but they cheat a lot. Andrighetto et al. used neutral language and context free tasks in their experiment to compare the behaviour in these countries. They did not find variation in generalized dishonest behaviour, and the result could be consistent with the findings in the Mann and colleagues' study. In fact, Andrighetto et al. did not use a context to test the cheating behaviour of the subjects and according to Mann et al. the presence of a context is necessary to activate the cultural internalized norms that affect the cheating behaviour that would remain dormant otherwise.

Therefore, general dishonest behaviour of people seems to be more similar than expected across countries. However, when specific acts of dishonesty are tested, for which cultural or social norms do exist, people seem to behave differently from country to country. They can even be affected by specific group's norms (Ariely, 2012).

In particular, Ariely compared two different "social" groups, bankers and politicians, on their dishonest behaviour. Bankers cheated twice as much as politicians, while politicians justified their behaviour because of the advantages that it could bring to everyone else too. In general, all the factors that make us rationalize the dishonest behaviour, analysing it in another light, justifying it, lead to an increase in dishonest behaviour (Shalvi et al., 2015; Ayal et al., 2011).

There are some factors that makes it easier to justify a dishonest act. For example, observing peers behave dishonestly too can give us a sort of approval in behaving the same way (Gino et al., 2009; Gino & Ayal, 2011). Having a bad opinion regarding the entity we are deceiving or considering it too authoritative (Fieldman, 2003), can make us think about our dishonest behaviour as a noble act of rebellion. Thinking about the "greater good" (Gino et al., 2013), can

justify the dishonest behaviour as an altruistic act, a moral sacrifice made to benefit the others. In general, having some sort of ambiguity in the context that can be manipulated to preserve a good image of themselves increased the dishonest behaviour. On the opposite, reminders of moral obligations (like reading the 10 commandments before a test) or factors that make people realize the consequences of the dishonest action, mitigate the cheating behaviour (Mazar et al., 2008, Ariely, 2012). These findings together suggest that if peer pressure affects the dishonest behaviour somehow, it does so through social norms. In particular, observing unethical behaviour across the group of people with which the subject identifies the most increases the probability that he will behave dishonestly too, compared to observing the same behaviour in someone that does not belong to his group (Gino et al., 2009).

If social norms and peer pressure are both factors that influence the dishonesty of an individual, then we can hypothesize that the need of the individual to conform to norms and to others plays a role too.

The most common form of dishonesty naturally observable in a social context is lying behaviour: social interactions are founded on lies that smooth the relationships and those social lies are the majority of the lies that we tell (Mann et al., 2014). Mann and colleagues investigated how the lying behaviour of a subject can be affected by the general level of lying behaviour of his social network. They found evidence that the tendency to use social lies transmits across people belonging to the same cluster. Lying behaviour is socially transmitted, meaning that people use social lies because they learned it implicitly from the social network in which they are integrated. They also observed a similar pattern in the tendency to use specific types of lies in people from the same countries, which makes sense if the country is considered as a big social network with shared values. If the degree with which people exploit social lies is affected by the culture of their country, then it makes sense that the more conformists the society the more these lies will be used.

Together these findings suggest that the tendency to lie in a social context should differ from country to country, being affected by the different cultures. In particular, this study aims to investigate whether social conformity increases people's intention to lie, especially when these lies are social or white lies. Arguably, a higher tendency to conform should lead to a more intense use of lying in social contexts, as stated in our hypothesis: people will tend to lie

more when they interact with vignettes containing a social context, compared to neutral vignettes (H2a); people who have a high social conformity level (score high on the MLAM test) will have a higher tendency to lie compared to people with a low conformity level (H2b); especially people who score high on social conformity will have a higher tendency to lie when interacting with the social vignettes (H2c).

1.2 Theoretical Background: Reaction Times and Tendency to Lie

Reaction times are intended as the time needed for a subject to respond to a certain stimulus, or to carry out an action. They are widely used in Psychology and Neuromarketing (Ramsøy, 2015) to measure certain behavioural or cognitive patterns. If the tendency to lie is indeed affected by the level of social conformity, does it mean that conformists, being more "used" to lie, are also faster than non-conformists in dealing with social lies? To reply to this question an analysis of reaction times is necessary.

Reaction times were already used in relation to lying at the first years of the 20th century (Jung, 1910; Wertheimer, 1906), in a tentative to detect crimes. Thought years, the validity of reaction times in detecting lies was often questioned, to the point that the academic debate started to lose interest in them (Suchotzki et al., 2017). However, recently the developing of new theories has given a fresh restart to the discussion about reaction times. Research is now considering the cognitive effort necessary to lie as an explanation to the longer reaction times (Vrij et al., 2006, 2011). The theory basically explain how fabricating a lie is a long process for the brain mechanism, since a new story has to be invented, while checking if the interlocutor believes it or not. The necessity to suppress the instinct to tell the truth also requires a higher effort from the brain and plays a role in the longer time needed to lie (Vrij et al., 2006, 2011). A higher self-control is necessary to lie, resulting in higher reaction times (Mead et al., 2009).

Moreover, a proof of the existence of a relationship between social interactions and lying behaviour can be found in the areas of the brain engaged in these two activities. A study discovered that the regions activated in the human brain when people are lying and the regions activated when interacting in a social context are the same (Abe et al., 2007), suggesting that the brain considers them as similar processes. Moreover, an analysis of the reaction times revealed a significant effect of dishonesty, suggesting that deceiving the interrogator actually required a higher cognitive effort. This could be relevant in proving the existence of an effect of social conformity on the tendency to lie and on the reaction times when lying.

Moreover, this research proposes to create a better understanding of the correlation between social thinking (how people operate their choices when those have consequences on, or when those include, other people), social behaviour (how they proceed to translate these choices into actions) and the speed of this kind of thinking and behaviour (Ramsøy, 2015). Several studies have been conducted over the topic, where the reaction times of the subjects are measured to see if they can be affected by a specific context or if they have a relation with the choices that the subjects make (Shapiro, 2008; Stewart et al., 2018; Rubinstein, 2007).

Some of them showed how reaction times were a valid indicator of the difficulty of a task and could be used as an instrument to detect lies (Shapiro, 2008; Suchotzki et al., 2017; Walczyk et al., 2014). The concept behind all of them is that lying requires more time because first the truth is recognized, then the brain has to activate the inhibition system to suppress the instinct to tell it, and then the truth has to be altered to fabricate a lie (Sheridan & Flowers, 2010); hence lying requires higher self-control, which requires more time and effort to be activated, resulting in higher reaction times compare to telling the truth (Mead et al., 2009).

Others demonstrated how reaction times can actually be influenced by the context in which the subjects are immersed and its manipulations (Stewart, 2018). Stewart et al. found that the context and content of vignettes have an effect on the reaction times. Using vignettes to induce specific emotions in the subjects, they discovered that when the content of the vignettes was coherent with what the subjects saw around them, their reaction time were shorter, meaning that the content of the vignettes affected how fast they coped with a task. This result sustains the possibility that the reaction times will be affected by the social conformity of the subjects, if we manipulate the content of the vignettes to foster it.

In particular, another study by Van Bockstaele et al. showed how having some “training” in telling lies can actually reduce the reaction times (Van Bockstaele et al., 2012). In the experiment that Van Bockstaele et al. performed, the subjects with some practice in lying had shorter reaction times compared to the ones without practice, probably because training reduced the cognitive cost and effort of lying. This result provides a useful insight for the hypothesis that conformist people, having more practice in using social lies compared to non-conformists, will have shorter reaction times of social lies in the vignettes. Knowing that reaction times are subjected to a context effect, then, they will be used to prove that the same subjects who needed the most the social approval are the ones that lied the most in vignettes

with a social context. Regarding reaction times, we hypothesize that people will have shorter reaction times when they interact with vignettes containing a social context, compared to neutral vignettes (H3a); individuals who have a high social conformity level (score high on the MLAM test) will have faster reaction times compared to people with a low conformity level (H3b), and especially people who score high on social conformity will have faster reaction times when interacting with the social vignettes (H3c).

2. Methodology and Experimental design

A Qualtrics survey containing the social conformity test, the vignettes and some demographics was distributed across students through social media platforms. All participants received the same survey except for the vignettes part, that randomly contained either three "treatment" vignettes or three "control" ones. In fact, the experiment consisted of two conditions: the treatment, where subjects received vignettes that contained social cues to trigger the social conformity and the control, which consisted of vignettes with a context manipulation that was neutral towards social conformity. The sample was then divided in people who randomly received the treatment, 117 participants, and people who received the control condition, 117 participants. In order to test the relation between reaction times and social conformity reaction times when responding to the vignettes' questions were registered by Qualtrics.

Before distributing the survey across all participants, some previews were distributed to ensure the clarity of the questions and survey in general. Based on the feedback on the comprehensibility of the structure, "wording" and instructions contained in the questionnaire, the vignettes text and the demographics' part were changed before finalizing the survey.

The MLAM test was reported exactly as stated by their creators (Martin, 1984), while the content of the vignettes was manipulated exploiting the literature on factors that encourage or discourage social conformity (McKelvey and Kerr, 1988; Salvy et al., 2007; Bordia, 1997; Bohra and Pandey, 1984) (see Figure 3 in the Appendix). Two dependent variables are included in the study.

The dependent variables consist of the subjects' responses to the Vignettes (measured on a continuous scale from 0 to 100) and their reaction times while replying to the vignettes, measured in seconds. To obtain the final Vignettes score for each subject, the arithmetic mean of the three responses to the Vignettes was calculated, as well as the mean of the reaction

times to each vignette (intended as the time passed until the subject submits each vignettes page).

The first independent variable of interest is the individual level of social conformity of the subjects measured by the MLAM test. The second is the manipulation of the context in the treatment and control condition, to see if there is an interaction effect with the social conformity.

When analysing the relationship between the MLAM score and the vignettes responses, the subjects were divided in non-conformists (average score from 1 to 3) and conformists (3-5). An ANOVA analysis was performed to identify the differences in the means of the Treatment and Control vignettes score over the categories. The MLAM Score is the mean of the responses to each question of the test for each subject.

A between-subjects design was exploited to find differences in the intention to lie over two groups of different participants, one received the treatment and one the control. Moreover, inside each condition, subjects were divided in high conformists and low or non-conformists. The aim of the study was to find a difference in conformist's tendency to lie and non-conformist's tendency to lie, both when they received the treatment and the control. The experiment wanted to test the effect that both the social conformity of the subjects (low vs high) and the vignettes context condition (social vs. neutral) had on tendency to lie score (first ANOVA analysis) and on reaction times (second ANOVA analysis). Moreover, an ANCOVA analysis is performed on sex, age, education, campus affiliation and cultural conformity level of the subjects, to check if these variables had a moderator effect on the tendency to lie.

2.1 Participants

The subjects were recruited across the Erasmus University students and students from other Universities through social media channels. Participants filled out a Qualtrics survey containing the MLAM test, Vignettes, and demographic questions.

In total, 273 participants took part in the experiment. First, the previews (4) and the incomplete responses (35) were excluded. The final sample consisted of 234 participants (160 females; age 14-81, *M* = 26.49, *SD* = 7.98); 117 participants received the vignettes contained

in the treatment condition (86 females; age 14-65, *M* = 26.22, *SD* = 6.81), 117 received the ones contained in the control condition (74 female; age 16-81, *M* = 26.76, *SD* = 9.01).

2.2 Material

To measure the independent variable, social conformity, the Martin-Larsen Approval Motivations scale was used. The cultural background of the subjects was also checked to see if it interfered with the individual social conformity of the subjects. In order to classify the cultures in conformist and non-conformist the table offered by the Hofstede's study on the four dimensions of the culture was used (Hofstede, 1983). The analysis also checked for an interaction effect between social conformity and the manipulation of the context of the vignettes (control, treatment).

2.2.1 MLAM test

To define the level of social conformity of the subjects, a MLAM test that measures the subject's need for social approval, has been used (Martin, 1984). This test consists of a set of statements to which the subjects have to agree or disagree based on a 5-points scale (1=Strongly Disagree, 5=Strongly Agree) (See Appendix, Table 1 for the complete set of statements). The statements are built such that people are coherent with them even when the framing is reversed, meaning that their written and logic form is sound enough and truly detects people's behaviours. That means that if they agreed with the sentence "Depending upon the people involved, I react in the same situation in different ways" they should have disagreed with the statement "Depending upon the people involved, I react in the same situation in the same way". The higher a person scores on the test, the more he/she feels the need to conform to others to receive social approval. The reversed items in the MLAM scale are some statements that describe a non-conformist behaviour opposing the conformist one described in the other statements, in order to prevent order or scale biases. In this case, a lower score in a reversed item statement means a higher level of conformism in the subject. For this reason, the scores were reversed meaning that a 1 in this type of statements was transformed in a 5, a 2 in a 4, a 4 in a 2 and so on, to respect the meaning of the scale. (See Appendix, Figure 2 for a list of all the questions in the test).

The scale was tested for quality using Cronbach's alpha. The results showed how the scale is extremely valid scoring a= 0.89.

2.2.2 Hofstede's table

To investigate the effect of culture on people' lying behaviour, it is necessary to address first the culture that they consider their own. Since we are interested in the culture that affected someone most, and this may be different from the nationality of that person, the subjects were asked to state both their nationality and the culture they considered to have influenced them most. Nationality was asked only to stress even more to the subjects the difference between Nationality and culture, so that they would really think about what was the culture they considered theirs. To prevent a possible priming effect of these cultural questions, the demographics were asked at the end of the test.

To divide the cultures in conformist and non-conformist, the Hofstede's table that classifies countries based on four cultural dimensions was used (see Appendix, Table 2). In this case, the individualism/collectivism of a country was intended as a proxy of its low or non-conformity/high conformity (Bond & Smith, 1996), hence the score of each in this dimension was used to divide the nations in non-conformist/conformist.

The Hofstede table was exploited as a blueprint for the classification of subjects that come from a traditionally conformist country and the ones that come from a non-conformists one. Specifically, the countries with a score over 50 points were considered individualistic, hence non-conformist, while the ones below 50 points were considered as conformists. The scores reported were all checked with the updated ones in the website dedicated to the Hofstede's study (https://www.hofstede-insights.com/product/compare-countries/).

The dependent variables were two, the tendency to lie in social situation, measured by the use of some vignettes and reaction times.

2.2.3 Vignettes

Once the subjects were classified for their degree of social conformity, vignettes describing a social context with cues that trigger social conformity were exploited to investigate their social lying behaviour. The same methodology was used by Mann and colleagues when they investigated the social transmission of lying behaviour and by Carlson and Settle to explore how social conformity played a role in political discussions (Mann et al. 2014; Carlson & Settle, 2016). A vignette describes a hypothetical situation with which the subject can identify, to investigate behaviours that concern sensitive topics in which the subject could fear to be

judged negatively. Using them to investigate lying behaviour should mitigate the natural shame that people feel in admitting their dishonesty.

To build the social context of the vignettes some factors known as cues that trigger social conformity were used. In particular, the social context of the vignette was manipulated (Carlson & Settle, 2010) in the familiarity and identification felt with the group with which the subject interacted, the way in which he communicated with the group, and the status of his interlocutor. Indeed, several studies found that people conform more to strangers than with friends (McKelvey and Kerr, 1988; Salvy et al., 2007), they conform more if they interact face-to-face rather than electronically (Bordia, 1997), and they tend to conform more to the opinions of someone they consider of a higher status (i.e. boss) (Bohra and Pandey, 1984).

Table 3
Factors that manipulate the social conformity of a context

	Treatment (high social conformity)	Control (neutral social conformity)
Familiarity of the group (McKelvey and Kerr, 1988; Salvy et al., 2007)	Strangers	Friends
Method of communication (Bordia, 1997)	Face-to-face	Electronically (by phone)
Status of the interlocutor (Bohra and Pandey, 1984)	Professor	Hairdresser

N.B the specific factors in the treatment and control condition were chosen to be as realistic and close to the participants as possible.

Two types of vignettes were created: three vignettes ("treatment") contained factors that drive social conformity (high conformity social context i.e. interaction with strangers, face-to-face communication, interaction with a Professor); the other three ("control") contained factors that trigger it less (low social conformity context i.e. interaction with friends, phone communication, interaction with a hairdresser). These factors determined when people were more likely to conform. The expected result was to find people that are more conformist showing a higher intention to lie when facing the "treatment" vignettes, while the high conformity social context should have had less effect on people that do not care about others' approval. Regarding the low social context vignettes, the expected results predicted that both

high and low conformist should have shown less the intention to lie when interacting with the "control" vignettes.

Figure 1

Treatment vignette manipulated with a high social conformity context in the "familiarity" factor (i.e. "new group of people that you don't know well")

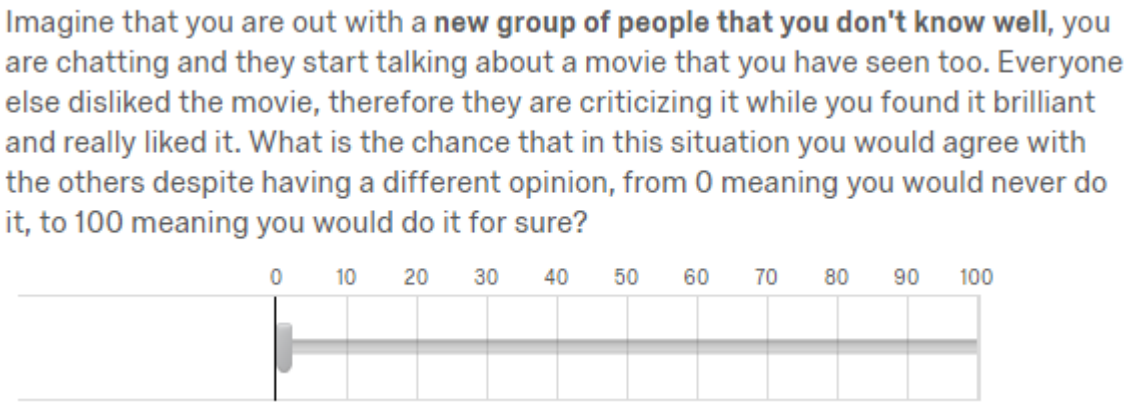
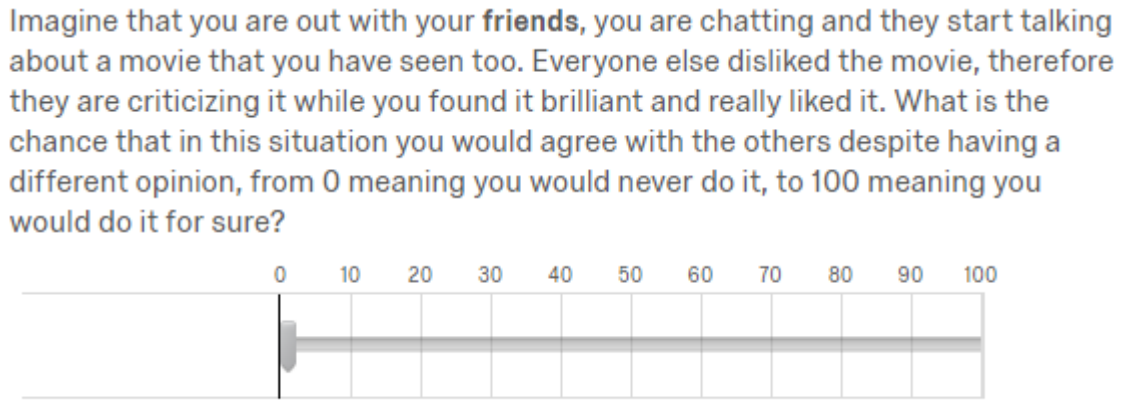


Figure 2

Control vignette manipulated with a neutral social conformity context in the "familiarity" factor (i.e. "friends")



Further examples of the vignettes can be seen in Figure 3 and 4 in the Appendix.

Treatment and control were randomized such that the same subject could not receive both the treatment (i.e. strangers) and the control (i.e. friends) version of the same factor (i.e. degree of familiarity and identification with the group).

In total, six vignettes were used in this study. Three variables (familiarity, modality of communication, and authority/status) were manipulated, creating either high or low social conformity contexts. In the low social conformity context, participants answered questions about hypothetical situations involving a group of friends, a phone communication and a conversation with their hairdresser. In the high social conformity context, participants answered questions about hypothetical situations with a group of strangers, a face-to-face interaction, and a conversation with their professor. However, in all the situations described, the opinion of the protagonist on a general matter, like a movie, was in contrast with the opinion of the other person or group of people. The participants had to choose how likely they would have lied and pretended to agree with the group, if the situation was real, knowing that telling the truth would have meant being the only one in contrast with the group.

2.2.4 Reaction Times

Reaction times can be useful sources of information on how people cope with a situation, when a cognitive process is involved. Indeed, they capture the cognitive effort required by a certain action: the more complex the task, the higher the effort necessary to act, the longer the reaction times (Walczyk et al., 2014). Previous studies showed how the people who were the best in social skills were also the ones with faster reaction times (Walczyk et al., 2005), suggesting that people with higher social conformity could show shorter reaction times. Furthermore, reaction times are particularly useful when they are associated with vignettes, because they can capture how people cope and interact with sensitive themes (Tompkins et al., 2009; Santor et al., 2000). The combination of vignettes and reaction times is also useful to study the behavioural response of people to particular stimuli, to understand how much they are at ease in processing them (Sauer et al., 2011; Fussel et al., 2008; Stewart et al., 2018). To measure reaction times in our experiment, specific hidden questions in the Qualtrics survey kept track of the time passed between the start of the vignettes reading and the submission of the answer to it. The reaction times were then used as a dependent variable, capturing how much at ease the subjects were in lying, depending on their level of social conformity.

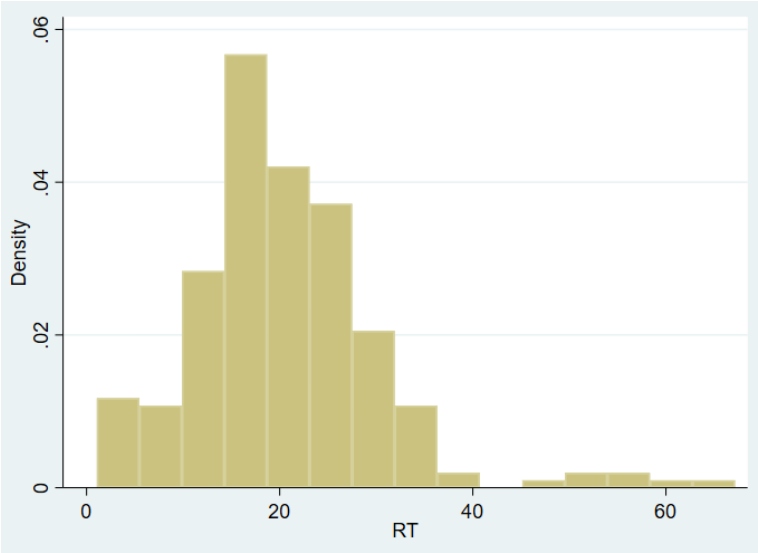
3. Proposed Analysis

A two-way analysis of variance was performed, once verified that the underlying assumptions for the validity of the analysis were satisfied.

3.1 Testing the assumptions

Specifically, the dependent variables were continuous, the independent variables categorical and the observations were independent, since the experiment was conducted through an online survey that everyone completed alone and only once (the same IP Address could not take the survey twice). As a result, the participants in each group were different. Furthermore, the presence of outliers was checked. Only the reaction times presented two outliers: two values that were four hundred times higher than the average value and were therefore removed from the sample. The normality of the dependent variables was tested by checking their skewness and kurtosis and a Levene's test was used to test the homogeneity of variances. The variables were approximately following a normal distribution, with values of kurtosis close to 3 (2.99 for the vignettes score, 7.03 for the reaction times) and skewness close to 0 (0.83 for the vignettes score, 1.32 for the reaction times). In particular, reaction times were approximately normally distributed, even if the kurtosis was higher than in a normal distribution, meaning that the distribution was heavy-tailed (the tails were more flattened than in a normal distribution), and the skewness was higher too, meaning that the distribution was more asymmetric than a Gaussian curve, as can be seen in Figure 5.

Figure 5



Furthermore, the variables were homogeneous in their variances, as showed by the Levene's test results ($p>0.10$ for both vignettes scores and reaction times).

For each group (conformists/non-conformists in treatment and conformists/non-conformists in control), the ANOVA analysis compared the mean scores that these groups obtained on a continuous variable (respectfully the vignettes scores when the treatment condition and the control were implemented for the first ANOVA analysis and the reaction times when the treatment and control conditions were implemented for the second ANOVA analysis).

4. Results

To test whether the social conformity level of the subjects affected their tendency to lie and their reaction times in social situations, and to test whether the social conformity level present in the contextual manipulation of the vignettes affected the tendency to lie and the reaction times, we performed a two separate two-way ANOVA analyses. These ANOVA analyses were expected to reveal a positive correlation between the dependent variables "attitude towards lying" and "reaction times", observed with the vignettes, and the independent variable "degree of social conformity", measured with the MLAM test. Moreover, the cultural background was expected to have a role in shaping the social conformity of the subjects, meaning that people from conformist countries should have had higher tendencies to lie in the vignettes, compared to who came from non-conformists countries. To test which method was better to divide the subjects in high or low conformist, a Pearson correlation test and a two-way ANOVA analysis were conducted. Both the scenarios were run, to see which variable had the higher influence on the vignettes score.

4.1 H1: Cultural background

The first hypothesis concerned the link between the cultural social conformity level of the subjects and their individual conformity level. In particular, it was theorized that the participants' conformist culture influenced their individual propensity to conform. Therefore, to test the presence of a correlation, a Pearson chi-squared test was run. However, the results ($corr(1, N = 234) = -0.09$) showed no correlation between the cultural conformity level and the individual conformity level and the first part of the hypothesis was rejected (H1a).

To see whether the variable that captured the culture of the subjects had a moderator effect in the interaction between the individual social conformity and the vignettes score, an ANCOVA analysis with the MLAM score as the independent variable, the vignettes score as the dependent variable and the cultural background as the covariate was performed. The analysis

showed no statistically significant interaction (F(1,234)= 0.08; p= 0.77; η2= 0.0003), meaning the cultural social conformity had no moderator effect on the individual level of conformity. Hence, the second part of the first hypothesis was rejected too.

Finally, to test which method to split the data had the higher influence on the vignettes scores, between the MLAM test division and the separation made by cultural social conformity, we conducted a two-way ANOVA. Results showed how the MLAM test was actually the best method (F(1, 234)= 21.92; p= 0.000; η2= 0.087) compared to the cultural social conformity division (F(1,234)= 4.74; p= 0.03; η2= 0.02), as it can be seen by observing the eta-squared. Eta-squared is a measure of the proportion of variance of the dependent variable, vignettes score, explained by an effect (the effect of individual or the effect of cultural social conformity on vignettes score). The larger the values of eta-squared the higher the impact of that variable's effect on the dependent variable. Therefore, the division by MLAM score was carried out in the following analyses (H1c).

4.2 H2: Lying tendency

The second hypothesis postulated that subjects who scored high in the MLAM test would have also had a higher tendency to lie in the social vignettes. In other words, we expected the vignettes scores of conformist participants in all the contextual manipulations (high or neutral conformity context) to be higher than the vignettes scores of the low conformist participants in all the manipulations.

The two-way ANOVA with vignettes scores as the dependent variable and contextual manipulations and conformity level as independent variables, revealed no effect of the contextual manipulation (high conformity/neutral condition) over the tendency to lie of the subjects (F(1,234)= 0.19; p= 0.66; η2= 0.0008). When comparing the sub-scores, we can clearly see how the different manipulations had no effect on the vignettes scores, since the means and standard deviations are similar across the different conditions (Table 4).

Table 4

Sub-scores of the vignettes

Type of vignettes	Mean	Standard deviations	F	p-value	η2
Treatment Strangers	30.47	25.78	10.08	0.0019	0.081
Treatment Face-to-face	25.41	25.3	8.58	0.0041	0.069
Treatment Professor	29.84	26.32	15.01	0.0002	0.115
Control Friends	23.12	25.83	7.72	0.0064	0.063
Control Phone	21.97	25.31	3.44	0.0660	0.029
Control Hairdresser	36.37	31.57	6.60	0.0115	0.054

The first part of the second hypothesis (H2a), was then not confirmed.

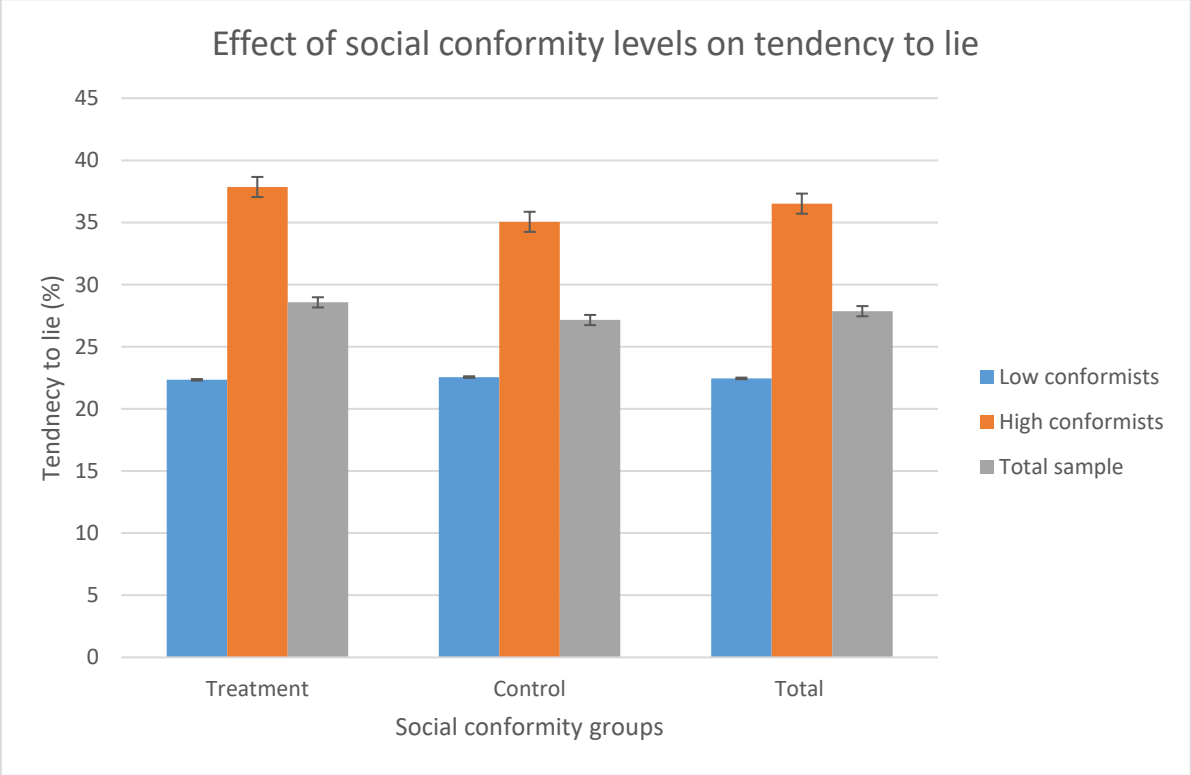
However, the results showed a statistically significant difference ($F(1,234)= 21.92$; $p< 0.001$; $\eta2= 0.08$) between high conformists and low conformists' vignettes scores, with high conformists scoring higher ($M= 36.52$, $SD= 22.7$) on the vignettes than low conformists ($M =22.45$, $SD= 21.84$), when the vignettes scores were aggregated in a single average score. The second part of the hypothesis was then confirmed (H2b) by the research meaning the more someone is conformist the more he will tend to lie in social situations, both when the social cues foster social conformity or not. The social conformity level of the individual actually affects his tendency to use social lies.

The last part of the hypothesis (H2c) was also not confirmed: there was no statistically significant interaction between the conformity level and the contextual manipulations (high/neutral context) ($F(1,234)= 0.26$; $p= 0.61$; $\eta2= 0.001$), meaning that the social context manipulation was unsuccessful.

The results of the first ANOVA analysis are reported in the bar graph below (Figure 6). As treatment and control conditions we intended respectfully the contextual manipulation that trig-

gered social conformity and the neutral contextual manipulation. As the graph shows, the average tendency to lie (i.e. average vignettes responses), was higher in the high conformists compared to the low conformists, but consistently similar across treatment and control.

Figure 6



4.3 H3: Reaction times

The third hypothesis theorized that high conformist subjects, interacting with high social conformity vignettes, were also the ones faster in replying to the social vignettes, because their high tendency to conform would work as a sort of training to interact with that kind of situations.

Hence, a two-way between-groups analysis of variance was conducted to explore how different levels of conformity in the subjects could affect their reaction times when they were responding to the vignettes. The two-way ANOVA with reaction times as the dependent variable and social conformity level (i.e., MLAM score) and contextual manipulations as the independent variables, revealed that there was a statistically significant effect of the contextual manipulations on the reaction times ($F(1,232)= 4.17$; $p= 0.04$; $\eta 2= 0.018$), with people in the high context manipulation (when social conformity was triggered) ($M= 19.03$, $SD= 9.12$) having shorter reaction times than in the neutral condition (neutral conformity

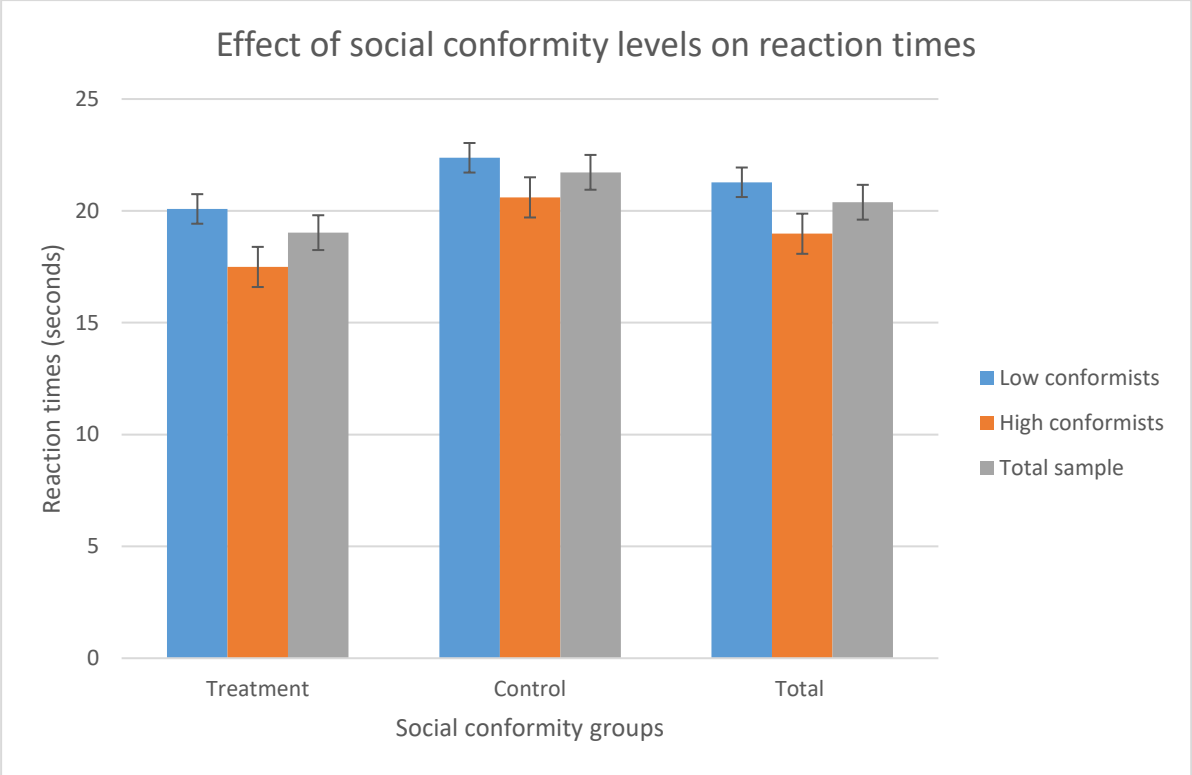
context) (*M*= 21.72, *SD*= 10.45). The first part of the hypothesis was then confirmed, the manipulation of the context had an effect on the reaction times (H3a).

The conformity levels also had a marginally significant effect on the reaction times ($F(1,232)= 2.73$; $p= 0.10$; $\eta2= 0.012$), with high conformists people (*M*= 18.98, *SD*= 9.92) having shorter reaction times compared to low conformist ones (*M*=21.28, *SD*=9.79), even if the effect was weak (p= 0.10). The second part of the hypothesis was also confirmed (H3b): even if with a weaker relation, high conformists are faster in replying to the vignettes compared to low conformists.

However, there was not a statistically significant interaction effect ($F(1,232)= 0.10$; $p= 0.76$; $\eta2= 0.0004$), meaning that the manipulation was again unsuccessful, and the last part of the hypothesis was rejected (H3c).

The insights of the second ANOVA analysis are reported in the graph below (Figure 4). As the bar graph shows, the high conformists had lower average reaction times, meaning they were faster in choosing whether to lie or not in the vignettes compared to the low conformists. Furthermore, average reaction times were higher in the neutral contextual manipulation (i.e. control) where no cues that triggered social conformity were given. Overall, the high conformist subjects were faster when interacting with high contextual manipulations.

Figure 7



4.4 Demographics

An additional ANCOVA analysis was performed to test whether the variables Age, Sex, Education and Campus affiliation had a moderator effect over the relation between the social conformity and the tendency to lie. The results of the ANCOVA analysis between vignettes scores, social conformity and age, sex, and education were not significant, meaning that none of these variables served as a moderator. However, the ANCOVA analysis between vignettes scores and campus affiliation showed significant results.

In particular, the interaction between social conformity and sex was not significant ($F(1,234)= 0.16$; $p= 0.68$; $\eta2= 0.0007$), as well as the interaction between social conformity and education ($F(1,234)= 1.14$; $p= 0.34$; $\eta2= 0.015$), social conformity and age ($F(1,234)= 0.17$; $p= 0.68$; $\eta2= 0.0007$). The only marginally significant interaction was between social conformity and campus affiliation ($F(1,234)= 2.95$; $p= 0.09$; $\eta2= 0.013$), with people belonging to the Erasmus

University campus having higher vignettes scores. However, the high p-value and the extremely low eta-squared suggest a very weak relation.

5. Discussion

Previous research investigated the relationship between dishonest behaviour and cultural background, either finding an influence effect (Gächter & Schulz, 2016; Andrighetto et al., 2016; Fisman and Miguel, 2007; Barr and Serra, 2010) or not (Mazar et al. 2008; Ariely, 2012). Other studies focused on the factors that can affect the dishonest behaviour (Gino et al., 2009; Mann et al., 2014), like peer pressure or context manipulations (Carlson & Settle, 2010). Even more studies examined the relation between culture and social conformity (Milgram, 1961; Bond & Smith, 1996). However, there was limited literature that blended together all the research fields, investigating the link between social conformity, culture and dishonest behaviour.

The present study aimed to cover the gap in the literature, by investigating the relationship between social conformity, culture and a specific form of dishonest behaviour: social lies. Does the social conformity level of an individual affect his tendency to lie? Does his cultural background play a role in the relation?

The results of this study could have important repercussions on the way we think about deception and offer helpful insights for the techniques to detect it. Indeed, if the social conformity of the subjects affects their tendency to lie, it would be useful to take it into account when trying to detect deception, as a possible factor of disturbance in the process. Being reaction times one of the most popular techniques, we investigated whether the social conformity of the individuals distorted their reaction times. Moreover, we checked whether the social conformity level present in the context also affected the reaction times and the tendency to lie of the individuals.

To investigate whether the cultural background was correlated with the social conformity and tendency to lie of an individual, we based our research on a very interesting theory by Mann et al., which postulated how the cultural background of people affected their dishonesty by setting some social norms: these silent rules were implicitly communicated to the subjects through a context, and established the acceptability of the dishonest act in a specific situation (Mann et al., 2016). Indeed, other studies demonstrated how culture did affect the dishonest

behaviour of people in particular situations, like when they evaded taxes (Andrighetto et al., 2016), when they avoided paying tickets (Fisman and Miguel, 2007), or when they bribed an officer (Barr and Serra, 2010).

In our research, we wanted to test if the culture affected dishonest behaviour in a new particular situation: when people conform to others. In particular, we wanted to find whether the social conformity of individuals was affected by the cultural values of their country, and whether their propensity to conform affected their tendency to lie in social situations. Due to the sensibility of the matter, since people consider lying as a negative practice and are reluctant to admit it when they do lie, the experiment was conducted through an anonymous online survey and the tendency to lie was tested with six vignettes describing hypothetical situations. The hypothetical scenarios of the vignettes described specific situations in which people in general feel the need to conform to the others, and contained situational factors (i.e. familiarity, status of the interlocutor, modality of communication) that are known to influence social conformity and dishonest behaviour (Mann et al., 2016; McKelvey and Kerr, 1988; Salvy et al., 2007; Bordia, 1997; Bohra and Pandey, 1984).

Indeed, based on the insight that situational factors can affect dishonest behaviour (Mann et al., 2016) and social conformity (Carlson & Settle, 2010), we wanted to investigate whether the social conformity level implicitly contained in the social context could also have an effect on the tendency to lie of the subjects, when it is manipulated through the situational factors, by communicating the acceptability of lying to conform. Deception used to conform is viewed in different ways in different cultures, hence culture should affect the tendency to lie in social situation (through the social norms communicated by the social situation).

However, there was no correlation or moderator effect between the culture of subjects, social conformity and tendency to lie in our study, in contrast with previous research. Furthermore, the manipulations of the context through the situational factors did not affect the tendency to lie of the subjects in any of the further analyses. A possible explanation for the result could be that the situations described by the vignettes were hypothetical, while the scenarios of the other studies previously mentioned were real. It could be that the hypothetical scenarios were not “strong” enough to activate the social norms associated by the participants to that specific situation, communicating the acceptability of lying in that specific situations. It would be interesting to replicate the experiment using real situations in which people feel the need to

conform instead of hypothetical ones, to test whether social norms really communicate to the individuals how to behave.

The cultural background of the subjects had a weaker effect than their individual social conformity levels on the tendency to lie, hence the latter was used to investigate the relation between social conformity and tendency to lie. The following analysis showed how the context of the vignettes had no effect on the tendency to lie; however, people with a high tendency to conform were more inclined to lie compared to who had a low tendency to conform. High conformists showed a higher propensity to lie than low conformists. The result was in line with a study by Carlson and Settle, who found how a high individual level of social conformity affected negatively the subjects' willingness to express their true opinion in a political discussion (Carlson & Settle, 2016), and with the study by Kashy and DePaulo, who found that the more someone was sociable the higher was his tendency to lie (Kashy & DePaulo, 1996). We further extended this knowledge by testing how individual social conformity interacted with the tendency to lie (i.e. not expressing the true opinion) of the subjects on a general, neutral issue as a movie.

Regarding the relation between social conformity and reaction times, we found that they were affected by both the situational factors presented in the vignettes manipulations and the social conformity of the subjects. In line with the studies of Stewart et al. we found that the context of a vignettes can affect the reaction times of the subjects (Stewart et al., 2018): specifically, we found that a context containing some social cues that fostered social conformity was easier to process for the subjects, hence they had shorter reaction times when interacting with a high social conformity context compared with interacting with a neutral context. Moreover, people with a high individual level of social conformity were faster in replying to social vignettes, having shorter reaction times compared to people who had a low level of individual social conformity. The result is in line with Walczyk's studies: the more someone is good in social interactions, the faster he will be in lying (Walczyk et al., 2005). Our research extended this finding, by linking directly high levels of social conformity with faster reaction times, offering a fast new method able to detect possible interferences when detecting deception with reaction times.

Indeed, in order to address for the social conformity interference with reaction times, future research can simply consider to present the subjects with a MLAM test, to register their level

of social conformity. The interference of the vignettes content and of the social conformity of the subjects should be taken into account in future studies involving reaction times.

6. Limitations and further research

Our research presents a few limitations. First, although using a survey to conduct the experiment allowed us to easily test multiple factors simultaneously, it also provided less control on the conditions in which the experiment was conducted. While we could be sure that the observations were independent because no one could retake the survey once completed, we could not check for other external factors that could have distracted the participants.

For instance, we measured the reaction times but the subjects were allowed to stop, do something else, and then continue the test, meaning that the results could have been misleading. Moreover, there is no proof that subjects actually told the truth in the survey: they could have felt ashamed or imagined what the others would have answered and conform to those expectations. Participants could have also predicted the expectations of the researcher, trying to reply in a way that complied with those.

To solve the problem, an experiment that test the actual lying behaviour of the subjects may be more suitable for the analysis. For instance, future research could investigate how the social conformity's level of the subjects affects their reaction times when lying in general, instead that in a specific context. In that case the same experiment could be designed, where instead of replying to vignettes the subjects perform a Stroop task after the MLAM test. The Stroop task would measure whether subjects with higher social conformity have faster reaction times to contradicting stimuli. If the tendency to lie is correlated with the social conformity and lying requires a cognitive effort (Vrij et al., 2006, 2011), and if the more someone lies the more he will become fast in doing it (Van Bockstaele et al., 2012), then it could be that being conformist decreases the reaction times in the Stroop task compared to being non-conformist.

Further limitations could derive from the method we used to divide the sample in high conformists and low conformists. We used the MLAM scores to identify the two groups, since the individual social conformity scores had a higher influence on the tendency to lie, compared to the cultural social conformity levels. However, using categories instead of the raw score of the

MLAM scale could have resolved in a biased division. The categories were chosen as objectively as possible (1-3 non-conformists or low conformists, 3-5 conformists or high conformists), but dividing the sample in a different way would could have led to different results.

Future research could focus on a new way of measuring the effect of social conformity on the tendency to lie. What would change in the relation between the lying tendency of the subjects and their social conformity, when they are additionally primed with social conformity? A study to investigate in that sense would replicate the experiment of the current research but the social conformity would be primed in some of the subjects (treatment condition), and not primed in others. Would the social conformity affect the tendency to lie anyway? Can priming social conformity increase the tendency to lie? The subjects would receive either a non-conformity priming stimulus or a conformity priming stimulus; we could then exploit the same method used in the first experiment to compare lie tendency in both groups, using the MLAM test to check their initial level of social conformity. It was already demonstrated that social conformity can be primed in subjects (Epley & Gilovich, 1999), would it be effective in changing their tendency to lie too?

7. Conclusions

The present study revealed how a higher level of conformism can result in a higher tendency to lie in social situations, whether those be neutral or encouraging the individual to conform. Moreover, the study showed how being more conformist can enhance the ability and the confidence in lying, resulting in shorter reaction times for people that conform more. Our findings can offer a better understanding of the factors underlying the tendency to lie and of those that can influence it. These new insights could help improving the techniques used to detect deception, in particular reaction times.

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9. Appendices

1) Table 1

Questions contained in the Martin-Larsen Approval Motivation scale (MLAM)

1.	Depending upon the people involved, I react to the same situations in different ways. (.97)
2.	I would rather be myself than be well thought of. (.88, .73)
3.	Many times I feel like just flipping a coin in order to decide what I should do. (.91)
4.	I change my opinion (or the way that I do things) in order to please someone else. (.72)
5.	In order to get along and be liked, I tend to be what people expect me to be. (.91)
6.	I find it difficult to talk about my ideas if they are contrary to group opinion. (.78)
7.	One should avoid doing things in public which appear to be wrong to others, even though one knows that he is right. (.75)
8.	Sometimes I feel that I don't have enough control over the direction that my life is taking. (.91)
9.	It is better to be humble than assertive when dealing with people. (.78)
10.	I am willing to argue only if I know that my friends will back me up. (88)
11.	If I hear that someone expresses a poor opinion of me, I do my best the next time that I see this person to make a good impression. (.94)
12.	I seldom feel the need to make excuses or apologize for my behavior. (.88, .73)
13.	It is not important to me that I behave "properly" in social situations. (.94, .83)
14.	The best way to handle people is to agree with them and tell them what they want to hear. (.84)
15.	It is hard for me to go on with my work if I am not encouraged to do so. (.78)
16.	If there is any criticism or anyone says anything about me, I can take it. (.84, .73)
17.	It is wise to flatter important people. (.81)
18.	I am careful at parties and social gatherings for fear that I will do or say things that others won't like. (.81)
19.	I usually do not change my position when people disagree with me. (.91, .93)
20.	How many friends you have depends on how nice a person you are. (.84)
Note : Responses categories : Disagree Strongly (1). Disagree (2). No opinion (3). Agree (4). Agree Strongly (5). N.B. The reversed items were the statements number 2, 12, 13, 16, 19.	

Martin (1984) "A Revised Measure of Approval Motivation and Its Relationship to Social Desirability", Table 1, p. 511.

2) Table 2

Hofstede's classification of countries based on their level of individualism

	Individualism	
Country	Idex (IDV)	Rank
Arab Ctrs .	38	(25)
Australia	90	49
Austria	55	33
Belgium	75	43
Canada	80	46-47
Denmark	74	42
France	71	40-41
Germany (F.R.)	67	36
Great Britain	89	48
Greece	35	22
Hong Kong	25	16
Indonesia	14	6-7
India	48	30
Ireland	70	39
Israel	54	32
Italy	76	44
Korea(S.)	18	11
Malaysia	26	17
Netherlands	80	46-47
Norway	69	38
Pakistan	14	6-7
Peru	16	9
Philippines	32	21
Portugal	27	18-19
South Africa	65	35
Spain	51	31
Sweden	71	40-41
Thailand	20	13-14
U.S.A.	91	50

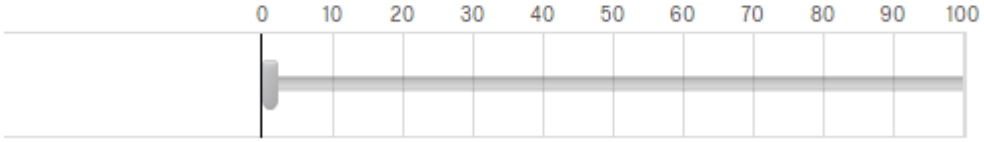
Hofstede (1983), "National cultures in four dimensions: A research-based theory of cultural differences among nations.", Table 1, p.52.

3) Figure 4

Vignettes examples: high social conformity contextual manipulation (Treatment)

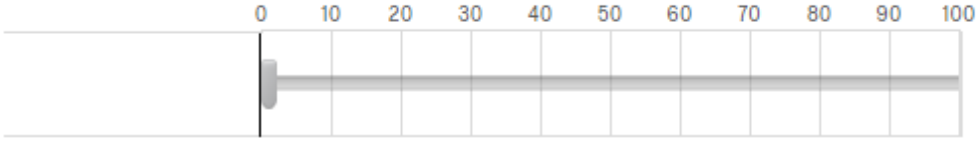
a) Familiarity of the group manipulation (McKelvey and Kerr, 1988; Salvy et al., 2007)

Imagine that you are out with a **new group of people that you don't know well**, you are chatting and they start talking about a movie that you have seen too. Everyone else disliked the movie, therefore they are criticizing it while you found it brilliant and really liked it. What is the chance that in this situation you would agree with the others despite having a different opinion, from 0 meaning you would never do it, to 100 meaning you would do it for sure?



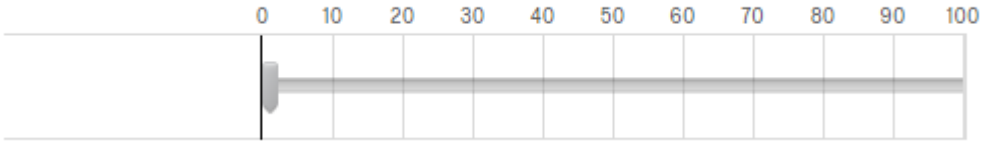
b) Method of communication manipulation (Bordia, 1997)

Imagine that you are talking **face-to-face** with someone, you are chatting and he/she starts talking about a movie that you have seen too. He/she disliked the movie, therefore he/she is criticizing it while you found it brilliant and really liked it. What is the chance that in this situation you would agree with him/her despite having a different opinion, from 0 meaning you would never do it, to 100 meaning you would do it for sure?



c) Status of the interlocutor manipulation (Bohra and Pandey, 1984)

Imagine that you are talking with **your Professor in class**, you are chatting and he/she starts talking about a movie that you have seen too. He/she disliked the movie, therefore he/she is criticizing it while you found it brilliant and really liked it. What is the chance that in this situation you would agree with him/her despite having a different opinion, from 0 meaning you would never do it, to 100 meaning you would do it for sure?

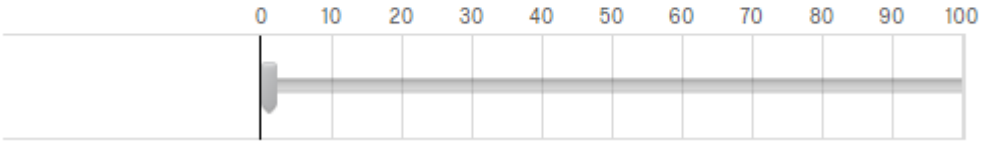


4) Figure 5

Vignettes examples: low social conformity contextual manipulation (Control)

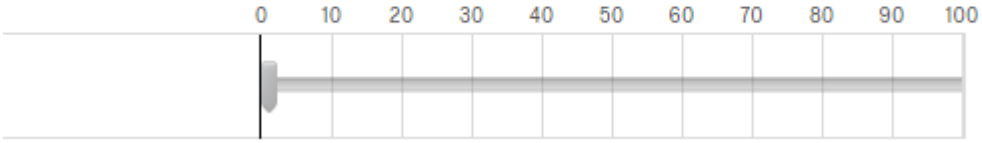
a) Familiarity of the group manipulation (McKelvey and Kerr, 1988; Salvy et al., 2007)

Imagine that you are out with your **friends**, you are chatting and they start talking about a movie that you have seen too. Everyone else disliked the movie, therefore they are criticizing it while you found it brilliant and really liked it. What is the chance that in this situation you would agree with the others despite having a different opinion, from 0 meaning you would never do it, to 100 meaning you would do it for sure?



b) Method of communication manipulation (Bordia, 1997)

Imagine that you are **messaging on the phone** with someone, you are chatting and he/she starts talking about a movie that you have seen too. He/she disliked the movie, therefore he/she is criticizing it while you found it brilliant and really liked it. What is the chance that in this situation you would agree with him/her despite having a different opinion, from 0 meaning you would never do it, to 100 meaning you would do it for sure?



c) Status of the interlocutor manipulation (Bohra and Pandey, 1984)

Imagine that you are **at the hairdresser and you start talking with him/her**, you are chatting and he/she starts talking about a movie that you have seen too. He/she disliked the movie, therefore he/she is criticizing it while you found it brilliant and really liked it. What is the chance that in this situation you would agree with him/her despite having a different opinion, from 0 meaning you would never do it, to 100 meaning you would do it for sure?