Can we trust trust explanations?

An experimental illustration of how outcome based accounts of trust struggle to explain a basic phenomenon of human life

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2. Introduction

I ask the reader's forbearance as I relate a true story that has a bearing on the topic of this dissertation. While I was working on this dissertation, I received a grant for a visit to the University of California, Berkeley, for the fall semester 2010 and the beginning of the spring semester 2011. In the fall semester I was fortunate to find a room in the International House of Berkeley, where I spent a wonderful time with 600 other students from all over the world. However, the International House only rents rooms for entire semesters so I had to search for new accommodations at the end of December. I waited too long with my apartment-hunting and eventually wanted to make an agreement with an elderly woman (Helen) just 2 weeks before I left the United States for a 9-day trip with my girlfriend in Europe. To be precise, I did not really formalize the agreement, but mentioned on the phone that I would like to take the room, and my future landlady said, "OK". When I asked her how much I would have to pay as a deposit, she answered that this would not be necessary. That aroused my curiosity. I explained to Helen that this was foolhardy since she did not know me, and I could change my mind and rent another flat, so she might end up with her room unrented. I asked her why she would trust me. That confused the old lady. At first she did not answer my question but asked me whether I intended to be a "bad boy." Then Helen told me that it would be too big a hassle to demand a security deposit because that would mean going to a bank or making an appointment with me. Nevertheless, my rational deliberations that I communicated unfiltered to my future landlady had a lasting effect as I would learn very soon. Just before I left the United States, Helen said she wanted to cancel my room rental, informing me that she thought I did not intend to show up. I had to write a few emails and provide some explanations to convince her that I am trustworthy. When I was eventually living in Helen's flat, I noticed that she was a quite

suspicious person. Every other week she forwarded me the community alert email and told me how dangerous Berkeley was. When I had a very painful gastritis flare up, she tried to convince me to go to a general doctor she trusted, reasoning that most doctors are untrustworthy and just want to make money.

This story relates quite well to the topic of this work. I will examine human trust behavior on the individual level. I provided this real-world example to underline that the goal of this work is to examine trust as it emerges in everyday life and not as an abstract construct that is important only in the ivory tower.

Turning the scientific spotlight on the topic of trust, it becomes apparent that Helen behaved like many people when they are put into a trust situation. People trust strangers in anonymous one-shot interactions (Berg, Dickhaut, & McCabe, 1995; Eckel & Wilson, 2000, 2004) although they should not do so according to a strictly rational point of view advocated by economic or rational choice theorists.

In addition, high trust rates are observed although people are generally cynical about the trustworthiness of their potential interaction partners (Fetchenhauer & Dunning, 2009, 2010a, 2010b). In other words, people are suspicious cognitively but behave as trusting individuals on the behavioral side (Fetchenhauer & Dunning, 2009, 2010a, 2010b). Furthermore, people accept more risks in trust situations than in risky situations void of trust (Fetchenhauer & Dunning, 2009, 2010b). Even, the phenomenon that trust can suddenly vanish, when potentially negative consequences of trust are brought to a person's attention was shown empirically (Kugler, Connolly, & Kausel, 2009), and I will come back to this at the end of my work.

However, the main question at the center of this work is not why people distrust, but *why people do trust*. Trying to answer this question, I will apply game theoretical paradigms in experimental settings. Mainly, I will focus on explanations that assume people

trust because of consequential considerations, meaning that people use trust as an instrument to accomplish or avoid a certain outcome.

However, I will also discuss whether people trust because of factors and dynamics that are unrelated to the outcome of a trust decision but influence participants at the very moment they make their decision to trust. Such factors and dynamics include social norms, personality, or emotions.

Furthermore, I will review whether findings of previous research about trust might be the result of methodological flaws, and I will examine behavior in trust situations that occur in everyday life but have not been previously considered in an experimental setting.

Unfortunately, I will not find out why people trust. However, I will show which explanations fail to explain trust and how our ideas about trust have to be changed in order to clarify this phenomenon. At the end of this work, I will suggest some studies that should be carried out in the future and provide a look at additional fields of trust research.

2.1. Why trust is important

> "The advantage to humankind of being able to trust one another penetrates into every crevice and cranny of human life."
>
> (John Stuart Mill, 1848)

John Stuart Mill claimed more than 160 years ago that trust has a beneficial impact on every part of human life. From a present-day perspective, we can say that Mill's claim contained amazing foresight. In the present day, the positive effects of trust have been examined by scholars of various disciplines, including economists, sociologists, and psychologists. Some positive effects of trust are pretty obvious. Most people would agree that trust is an indispensable prerequisite for romantic or amicable relationships. Indeed, this can be corroborated by psychological research (Bierhoff,

1992; Miller & Rempel, 2004). High levels of interpersonal trust are also associated with happiness, mental as well as physical health, and a longer life (Barefoot, Maynard, Beckham, Brummett, Hooker, & Siegler, 1998; Rotters, 1980). However, trust also plays an important role in parts of human life that are not so self-evident.

Economists have emphasized the importance of trust in economic transactions. Arrow (1972) argued that "virtually every commercial transaction has within itself an element of trust" (p. 357). Arrow (1974) emphasized the importance of trust to decrease transaction costs. Trust can diminish costs of contracts, monitoring and right enforcement between business partners - no matter whether the transactions are between individuals or companies. Thus, the existence of trust in business relationships is a competitive advantage (Barney & Hansen, 1994; Dyer & Chu, 2003).

Trust also has positive effects on a societal level, which was particularly underlined in Putnam's (1993) book *Making Democracy Work*. Although Putnam did not examine trust directly but trust as a crucial part of social capital, which also consists of social norms and networks, the book triggered a multitude of trust research at the societal level (e.g., Beugelsdijk, Groot, & Schaik, 2004; Whiteley, 2000; Zak & Knack, 2001). Researchers have argued that trust at a societal level reduces transaction costs (Fukuyama, 1995, Whiteley, 2000), which represent up to 60% of the entire gross domestic product (GDP) of a developed country (Dollery & Leong, 1998; Wallis & North, 1986; for a review, see Wang, 2003). In fact, a variety of studies showed that trust levels or social capital between countries can predict differences in their economic growth (Fetchenhauer & Van der Vegt, 2001; Knack & Keefer, 1997; Whiteley, 2000; Zak & Knack, 2001). Furthermore, trust has been positively related to the quality and maintenance of democracies and governments (Fukuyama, 1995; Knack, 2002; Paxton, 2002; Putnam, 1993) and

negatively related to corruption (Rothstein & Eek, 2009; Rothstein & Uslaner, 2005; Uslaner, 2002).

In summary, trust shapes the private, economic, and civic life of people, and the effects of trust can be measured at an individual, organizational, and societal level. However, the question emerges: What is trust? The next section shows that also the definitions of trust are as multifaceted.

2.2. Definition of trust

"Trust is a term with many meanings."

(Oliver Williamson, 1993)

Trust is such a prevalent and frequently discussed phenomenon that one might think that it has no clear definition. People trust that their romantic partners are faithful, or that their friends will repay a loan. They even trust that the radio purchased from an unknown private seller at a flea market will work when they get home and plug it into a socket. Though these examples seem to be very different at first glance, in the following section, I will point out their common elements.

First, the examples given reveal that trust is inseparably *linked to the future* (Sztompka 1999; Williamson, 1993). In the future, one will learn whether a friend will repay the money or whether the radio they bought will work.

Second, trust always involves *risk* (Coleman, 1990; Gambetta, 2000; Hardin, 2006; McKnight & Chervany, 2001). People do not know whether events, in which they trust, will occur in the future. Although they trust their romantic partner, they risk learning sometime in the future that their trust was groundless.

Third, when people accept risk in a trust situation, they make themselves *vulnerable*. They accept bearing the cost if events they

trust in do not occur in the future (Coleman, 1990). Referring to one of my examples, one's money is lost if the radio he bought at the flea market does not work when he tries to use it at home. In this case he has to bear the cost of not being able to listen to the news or the cost of buying another radio.

Fourth, trust occurs only if one *voluntarily* takes on the risk and vulnerability in a trust situation (Gambetta, 2000; Hardin, 2006). If someone lends his friend money only because he feels morally obliged to do so, his decision is not connected with trust.

Fifth, the risk people take in trust situations is *related to other people* (Coleman, 1990; Sztompka, 1999). This is not immediately obvious because people use the word trust in their everyday language when they are talking about things. People use phrases like "trusting in the government" or "trusting that an airplane will not crash." Indeed, in these examples one can point out that they eventually trust other humans. Every government consists of politicians, and when people trust that an airplane will not crash, they really trust that the airplane is well constructed by the engineers who built it and will be flown by responsible pilots.

Finally, a question arises about why people voluntarily make themselves vulnerable to other people and risk being hurt by these people in the future? The reason people do this is that they have *positive expectations* about the future (Sztompka, 1999). They expect that their romantic partner will be faithful, and they expect that the radio they bought at the flea-market will work at home. These positive expectations can be considered as the *psychological stat*e of trust or *cognitive trust*.

There are a myriad of definitions of trust in the literature (see McKnight & Chervany (2001) for an overview). The examples discussed above provide a general and comprehensive idea about what trust is. These elements are taken from a definition by Rousseau, et al. (1998) that is based on an interdisciplinary literature

review. They defined trust as “a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or the behavior of another” (p. 395).

Still, trust is mostly related to behavior (buying the radio, lending money) or is sometimes even defined as a behavior (see McKnight & Chervany, 2001 for an overview). The behavioral component of trust is not covered in the definition of Rousseau et al. (1998). However, it is important to differentiate between the psychological state of trust that comprises positive expactations about the future and *trust behavior* which only means that somebody is making himself vulnerable and dependent on another person. The reason is that from observations of trustful behavior the psychological state of trust cannot be inferred or vice versa (Fetchenhauer and Dunning, 2009; Dunning and Fetchenhauer, 2010). I have shown this in the example above in which somebody loaned money to his friend because he felt morally obligated. Thus, I will refer to the *psychological state* of trust as “trust on the cognitive side” while the *behavioral act* of making oneself vulnerable and dependent on another person will be referred to as “trust behavior” or “trust on the behavioral side”. In the discussion, I will show that trust even has an emotional component.

For the further consideration of trust in this dissertation, it also makes sense to distinguish between two different kinds of trust: *particularized* and *generalized trust*. Particularized trust is trust that people have in specific other persons they have information on. Particularized trust decisions are often shaped by face-to-face contact and reputation. In contrast, generalized trust is shown to strangers, people about whom one has no information (Bjornskov, 2006, Nannestad, 2008). In this work I will consider generalized trust only.

While most scholars will likely agree that the definitions I gave in this section describe the essence of trust quite well, there is a controversy about whether trust situations are inherently different

from risk situations void of trust. The next section sheds light on the mainstream position on that issue.

2.3. Economic and rational choice accounts of trust

> "Situations involving trust constitute a subclass of those involving risk. They are situations in which the risk one takes depends on the performance of another actor."
>
> (Coleman, 1990)

According to today's prevailing understanding of trust, people confide in one another on the basis of rational considerations about the outcomes of their trust decision, which are essentially the same considerations people apply to risky decisions void of trust. This understanding is rooted in very decisive assumptions about human nature, which are these days supported by neoclassical economists and rational choice sociologists (Berg et al., 1995; Coleman, 1990; Sztompka, 1999; Williamson, 1993). The first assumption is that people are egoistic utility maximizers. The second one is that people behave in a strictly rational manner. The last assumption is that people have the intelligence and strategic competence to behave rationally on the basis of all available information they have. This image of humanity is condensed in the concept of the *homo oeconomicus*. It is not entirely clear who used this term the first time (O'Boyle, 2008). However, one can trace the ideas that eventually led to the *homo oeconomicus* construct. These ideas are very old and were used by many important scholars. Because today's models of human behavior and decision making stem from the *homo oeconomicus* or particularly challenge this concept, I will illuminate the genesis of this idea in the next paragraphs more thoroughly.

2.3.1. The roots of homo oeconomicus

The idea that man is inherently egoistic can be already found in Plato's (2000[360BC]) *The Republic*. In this book Plato provides a dialogue between Socrates and Glaucon in which Glaucon tells the story of the shepherd Gyges. Gyges finds a golden ring that can make him invisible. He uses this power to seduce the queen and replaces the king after slaying him. Glaucon argues that every person with the same power would behave like Gyges, and that everyone who did not "would be thought by the lookers-on to be a most wretched idiot" (p. 44).

The concept of man as a rational actor can also be ascribed to the ancient Greeks. Aristotle referred to humans as rational animals. However, the ancient Greeks had a broader and less specified concept of rationality than people today (Rutgers, 1999).

Today scholars associate two people with the *homo oeconomicus* concept and the image of man as egoistic and self-serving. The first one is Niccolò Machiavelli, and the second is Thomas Hobbes. Machiavelli's (2003[1532]) *The Prince* not only described man as immanently egoistic and self-serving like no one before him but also promoted the idea that one has to act in an unscrupulous and calculating manner in order to be successful.

However, much more important in shaping the *homo oeconomicus* theory was Thomas Hobbes' (2009[1651]) *Leviathan*. In this book, Hobbes merged the traits of egoism and rationalism in one image of humanity. In addition, Hobbes provided a subjective conception of values that formed the basis for the development of utility theory (Cudd, 1993). He suggested that human action is based on subjective appetites and aversions, which are the last consequences of rational deliberations. Hobbes argued that these deliberations are best if they are a valid basis of the eventual consequences of an action. However, Hobbes stated that "seldome any man is able to see to the end" (p. 32), whereas the *homo*

oeconomicusis is endowed with an unbounded rationality and infinite processing capacity (Rolle, 2005; Todd & Gigerenzer, 2003).

The idea of utility theory was already latently present in Hobbes' (2009[1651]) *Leviathan* and can be found more clearly in the work of Locke and Hutcheson (Russell, 1945). A big contribution to utility theory was also made by Bernoulli who suggested that the value of any item should not be measured by its price but by the utility it yields (Cudd, 1993). However, the first one who used utility theory to solve actual problems and draw the attention of the collective mind to this idea was Jeremy Bentham (Stigler, 1950). Bentham's approach to utility was broader and more specified than Bernoulli's. He suggested that all pleasures and pains can be subsumed in one utility index by taking into account the intensity, duration, certainty, and propinquity of pleasures and pains.

At the same time that Bentham was developing his utility theory, the idea of unbounded rationality and full information emerged because mathematics thrived in the early 19th century. The idea is symbolized in Laplace's (1951[1814]) demon that knows the condition of every atom in the universe and all laws of nature and is endowed with a super-intelligence that allows him to calculate the future, which is entirely determined by strict causality (Rolle, 2005; Todd & Gigerenzer, 2003). As already mentioned above, this idea was incorporated in the image of the *homo oeconomicus*. The *homo oeconomicus* behaves rationally in a determined world and has the intelligence as well as strategic capability to do so (Rolle, 2005). However, the *homo oeconomicus* does not have full information but collects all information he can acquire by natural means in a situation (Guckelsberger, 2006). This is important for any further analysis since, if the *homo oeconomicus* were the demon of Laplace, he would not have to trust but would know the future and could decide on the basis of determined certainty.

2.3.2. The birth of homo oeconomicus

Today scholars see Bentham's student John Stuart Mill as the father of the *homo oeconomicus* (Guckelsberger, 2006; Persky, 1995, Rolle, 2005). Mill (1909[1848]) proposed to analyze the economy with the help of an abstraction of man so that economics "is concerned with him solely as a being who desires to possess wealth, and who is capable of judging the comparative efficacy of means for obtaining that end" (p. 326). This quote entails a subtle representation of the attributes ascribed to the *homo oeconomicus*: egoistc utility maximizing as well as superhuman rationality. However, Mill made clear that he was only speaking about an abstraction that is useful for economic analysis. He also emphasized that humans in real life are much more complex individuals. Nevertheless, in reaction to Mill's work, the term economic man and then the term *homo oeconomicus* were coined and associated with the abstraction of humans that is still used today in economic and sociological analyses (Persky, 1995).

2.3.3. Conclusions of the homo oeconomicus concept for trust decisions

Applying the construct of the *homo oeconomicus* in trust situations, people use trust as an instrument to maximize their utility. One can easily determine in which situations he or she (the trustor) should trust. Assuming that the current utility of the potential trustor will not change, if he distrusts, he should trust only if the expected value that will accrue from the decision to trust is positive (Coleman, 1990). The expected value of trusting equals the probability that the trustee is dependable times the gain or utility the trustor will receive in this case minus the probability that the trustee will be untrustworthy times the loss or disutility the trustor will suffer in this case. This analysis shows that from an economic or rational choice perspective a trust decision does not differ from a risk decision void of trust.

Furthermore, from the perspective of the *homo oeconomicus*, not only the trustor but also the trustee should behave rationally and egoistically. Accordingly, trustees should only behave trustworthily if it is in their own interest to do so. This in turn has an effect on the decision of the trustor. A rational trustor can anticipate the behavior of the trustee because the behavior and best (rational) strategy in a decision situation is common knowledge (Aumann & Brandenburger, 1995). Hence, trustors should trust only if it is in the interest of the trustee to be trustworthy. This kind of trust has been discussed under various names in the literature: trust as encapsulated interest (Hardin, 2006), calculative trust (Williamson, 1993), or self-interested trust (Lyons & Mehta, 1997).

As my example from the introduction suggests, everyday life seems to contradict these strong assumptions about the nature of trust. People do not seem to base their trust on calculative considerations. However, trust situations in real life are very complex, so it is hard to tell why somebody should be trusted in a real-life situation. Maybe my landlady told the truth. Although it seems very odd, she might have reserved the room for me without the security deposit because the hassle to make a deposit loomed larger for her than her estimated financial loss if I did not show up, and she weighed this against the expected probability of that happening.

To clarify this question, trust has to be considered in a more controlled environment.

2.4. How to measure trust towards strangers

In social surveys like the World Value Survey (WVS), the American General Social Survey (GSS), or the European Social Survey (ESS), trust towards strangers is measured by the question: “Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?” This one-item measure is advantageous because it can be collected quickly and easily from a large number of people. However, it is also a very

abstract and vague measure of trust (Glaeser, Laibson, Scheinkman, & Soutter, 2000). In addition, the trust people indicate in a self-reported study does not have any consequences for the respondents. Hence, it is possible that the respondents do not reveal their true attitudes but answer in a socially desirable way (Holtgraves, 2004). Economists generally distrust self-reports and even experimental data in which collected decisions are not monetarily incentivized (Smith & Walker, 1993). For these reasons, the present work examining trust is based on data collected in an experimental setting in which participants made real trust decisions for real money.

2.4.1. The trust game

The experimental setting I applied in this work is the binary trust game, a variation of the investment game (Berg et al., 1995), which is based on the "game of trust" (Güth & Kliemt, 1994) that in turn is originally based on the centipede game (Rosenthal, 1981). These were games first used by game theorists. Recently, behavioral economists and psychologists have also used the investment game and trust game to examine human trust behavior (e.g., Bohnet & Zeckhauser, 2004, Buchan, Croson, & Solnick, 2008; Eckel & Wilson, 2000, 2004; Fetchenhauer & Dunning, 2009, 2010a, 2010b).

In the investment game, two people interact anonymously via an experimenter. Both of them are endowed with a show-up fee. One participant (the trustor) can decide to keep his money or to hand over any fraction of it to the second person (the trustee). All money the trustor hands over is tripled by the experimenter before it is given to the trustee. Then the trustee has an opportunity to keep all received money for himself or to reciprocate that trust by sending any amount of money back to the trustor (Berg et al., 1995).

The binary trust game differs only slightly from the investment game (Fetchenhauer & Dunning, 2009, 2010a, 2010b). In this game, only the trustor is endowed with a show-up fee (e.g., €5), and he can decide only to distrust and keep all the money or trust and hand all

the money over to the trustee. If the trustor hands over the money to the trustee, it is multiplied (e.g., 4 times) by the experimenter and given to the trustee. The trustee then has an opportunity to be untrustworthy and to keep all the money (€20 in this example) or to be trustworthy and give half of it (€10 in this example) back to the trustor.

While the investment game deals with continuous trust decisions, the binary trust game deals with dichotomous ones. For this work, I used the binary trust game for two reasons. First, as mentioned above, this work should consider trust as it emerges in everyday life, and in the real world, trust decisions are mostly binary. People cannot buy only half of a used car because they do not trust the car dealer entirely. In the same way, a people cannot marry one another just a little bit because they are not totally sure that they love the potential partner. Second, in the investment game it is not entirely clear which behavior can be interpreted as a signal of trust and trustworthiness. On the side of the trustor, it is hard to say whether trustors who send only a tiny fraction of their show-up fee are signaling trust or distrust. With regard to trustees, it is ambiguous which behavior can be interpreted as trustworthy. A study by Pillutla, Mahotra, and Murninghan (2003) suggested that trustees consider it to be a signal of distrust if the trustor sends less than the maximum amount to them. In turn, the rate of reciprocation drops dramatically. The binary trust game avoids such interpretation problems.

2.4.2. Measures of trust in the trust game

The investment game was designed as a pure behavioral measure of trust and trustworthiness (Berg et al., 1995). It was implicitly assumed that trustors who handed over money to the trustee did so because they considered the trustee to be reliable. However, I have already pointed out that trust on the behavioral side does not have to cohere to the psychological state of trust (trust on

the cognitive side). Avoiding this potential pitfall, Fetchenhauer and Dunning (2009, 2010a) asked the trustors in their binary trust games to estimate the percentage of people that would behave in a trustworthy way in the role of the trustee before they made their decision. Thus, Fetchenhauer and Dunning extended the trust game by a cognitive measure of trust.

Although the cognitive measure of trust potentially suffers from the shortcomings of self-reports discussed above, the cognitive measure of trust was used in all underlying studies for this work. However, there are two reasons that the estimates of trustors should be a valid measure of their cognitive trust. First, in contrast to the one-item scale used in the WVS, GSS, and ESS, trustors in the trust game estimate the trustworthiness of others in a concrete and narrowly defined situation. Second, Fetchenhauer and Dunning (2010a) did not find any evidence that trustors do not reveal their true beliefs about the trustworthiness of others when their estimates are not incentivized. They compared the estimates of a group of trustors whose accuracy was monetarily incentivized to the estimates of a group of trustors whose accuracy was not incentivized. However, the quality of estimates did not differ significantly between both groups.

2.4.3. Basic findings in the trust- and investment game

Researchers who applied the trust or investment game reported that about 40-95% of trustors hand over money to a trustee and about 70-90% of trustees prove trustworthy and give money back to the trustor (Berg et al., 1995; Eckel & Wilson, 2000, 2004; Fetchenhauer & Dunning, 2009, 2010a). These findings strongly contradict the strict economic or rational choice approach to trust, which would predict that no trustee would prove to be reliable in this game and no trustor would hand over money.

2.5. Scientific integration of this work

The results of the trust and investment game as well as findings in other experimental games in which people do not behave according to economic principles have caused a change of thinking in economic science. The strict assumptions about the *homo oeconomicus* have been relaxed. Social preferences have been integrated in the utility function of economic subjects (Bolton & Ockenfels, 2000; Charness & Rabin, 2002; Engelmann & Strobel, 2000; Fehr & Schmidt, 1999), and the assumption of unbounded rationality has been rejected (Gigerenzer, 2008; Simon, 1959).

The newer economic approaches to human behavior differ to the extent that they break with the strict neoclassical assumptions. The accounts of most behavioral economists are still rooted in the strict economic tradition. They assume human behavior and human considerations are strictly *consequential*. According to this perspective, people only consider the *consequences* (outcomes) of their behavior. Accordingly, social preferences like fairness are considered as preferences for the outcomes of others (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999).

In contrast to this perspective, other scholars have made a more radical break with the neoclassical assumptions. They assume that human behavior is instead driven by intentions or emotions not just based on considerations about outcomes (Charness & Rabin, 2002; Falk & Fischbacher, 2006; van Winden, 2007). Returning to the example of fairness behavior from the last paragraph, according to intention- or emotion-based models, people are fair because they feel grateful or want to reciprocate kindness but *do not* think so much about the outcomes of their decisions.

If this framework is applied to the matter of trust, a question emerges about whether people use trust instrumentally to accomplish or avoid certain outcomes or whether trust is a behavior that is not driven by outcomes. Until this point, many researchers

have tested explanations of trust behavior that consider trust as a consequential behavior. These explanations empirically failed to elucidate trust (e.g., Eckel & Wilson, 2004; Fetchenhauer & Dunning, 2009, 2010b; Houser, Schunk, & Winter, 2010). Hence, a change in thinking might be necessary to explain trust behavior towards strangers. This phenomenon is possibly only explainable when trust is considered to be non-consequential but based on emotions, norms, or other dynamics that influence people while they make a decision to trust or distrust (Dunning & Fetchenhauer, 2010).

However, many consequential explanations regarding trust behavior have not been tested so far. Furthermore, it is possible that former findings contradicting the idea that trust is a consequential behavior were caused by methodological weaknesses. Building on the research that has already been done on the question of why people trust, this work should provide a more comprehensive, methodologically decisive, and systematical test of consequential explanations of trust.

In addition, at the end of this work I will provide an overview of newer research on non-consequential explanations of trust and make suggestions for further research.

3. Overview of current research

In Chapter 4, I will provide an overview of the findings and insights gained in experimental trust research. I will then discuss common consequential explanations and potential methodological reasons for high trust rates. Finally, I will present an empirical study in which all these explanations were tested using a between-subjects design.

In this study, my coauthors and I could not find out why people trust, but we showed which explanations fail to explain trust. First, we showed that trust rates did not decrease when participants had to hand over their own money, compared to past studies in which participants played with a show-up fee (*house money effects*). For the first time, we conducted a trust game in which trustors could only hand over their *own* money; however, similar to what occurred in past studies, 57.1% of trustors did so. Second, *anticipating high rates of trustworthiness* was not the reason for participants to trust. In fact, they underestimated this share by almost 20 percentage points. Third, high trust rates were not explainable by *high risk tolerance*. Only 25.3% of participants were willing to bet money, making a risky decision identical in gains and similar in risks to the trust game but void of trust. However, trust games entail second players who can benefit from the money trustors hand over. Therefore, trustors might hand over money because they have *preferences for equality* or want to *enlarge the pie*. Contradicting these arguments, only 28.3% of participants bet money in a risky decision, which was not only similar to the trust game regarding gains and risks but also those involving a second player. Thus, we could not find evidence that trust can be explained by one of the explanations we tested.

Chapter 5 deals with the question of how people behave in trust situations in which they cannot be better off if their trust is reciprocated by the partner with whom they interact (trustee). Former studies have examined only trust decisions in which people who trust

(trustors) were rewarded if the person with whom they interacted proved to be trustworthy. Thus, it is not clear to what extent the strategic motive to be better off plays a role in trust decisions in general. In Chapter 5, I present a study on that issue.

Using a full between-subjects design, this study examined non-strategic trust decisions in which participants cannot be better off or even only worse off by trusting others for the first time. To do this, my coauthors and I systematically manipulated the potential gains in trust games and compared them with lotteries void of any trust but equal in risks and gains. Our results show that both trust behavior and risky behavior unrelated to trust were dependent on potential gains and losses. However, whereas the number of risky decisions decreased to almost zero in lotteries entailing no or negative gains, trust behavior was comparably stable. Chapter 5 provides evidence that people do not trust strategically and that high trust rates are sustainable in different kinds of trust situations.

While I considered only explanations for trust behavior that are basically consequential in Chapters 4 and 5, I go one step further in Chapter 6. Here, I examine whether trust behavior in trust games is driven by the curiosity trustors feel in the moment they make their trust decision. Thereby, I illuminate the question whether the paradigm of the trust game itself causes the phenomenon of high trust rates. In addition, I examine the influence of regret aversion (the tendency of people to avoid future regret) on trust. In order to give an answer to this question, I present a study in Chapter 6 in which my coauthors and I compared a trust game with conditional feedback to a trust game with unconditional feedback (between-subjects).

Trustors in ordinary trust games receive conditional feedback only. That means they learn the trustworthiness of their trustee on the condition that they hand over their money to him or her. Thus, trustors might hand over money in trust games because they want to know whether their trustee is reliable. To find out, we compared an

ordinary trust game with conditional feedback to a trust game with unconditional feedback in which trustors always learned the trustworthiness of their interaction partner. In this trust game, trustors were always informed about the decision of their assigned trustee, no matter whether they kept or handed over their money.

Whereas the curiosity hypothesis predicts that more trustors hand over money when they receive conditional feedback, regret aversion would predict that fewer people will do so.

In the trust game with unconditional feedback, trustors cannot avoid potential regret triggered by their decision to keep or to hand over money. Trustors, who keep the money, run the risk of learning that their trustee was reliable and that they would have doubled their money had they handed it over. Trustors, who hand over their money, run the risk of learning that their trustee was untrustworthy and that they would not have lost their money had they kept it. Thus, regret aversion should not influence trustors to make a particular decision in the trust game with unconditional feedback. However, in the trust game with conditional feedback, trustors can avoid potential regret by keeping the money because then they will never learn whether their assigned trustee was reliable and that they would have doubled their money, if they had handed it over. Therefore, regret aversion should influence trustors in the trust game with conditional feedback to keep their money.

However, we did not find any difference between the trust rates in the trust game with conditional feedback and the trust game with unconditional feedback. Hence, neither the curiosity nor the regret hypothesis could be supported. At the end of Chapter 6, I discuss which implications these findings could have for further research.

4. Why do people trust?

"You must trust and believe in people
or life becomes impossible."

Anton Chekov 1860 – 1906

4.1. Introduction

Trust is an indispensable prerequisite for the functionality of human societies. No matter whether we buy something on ebay or start an intimate relationship – we have to trust and believe in other people. The introductory quote by Anton Chekov points out that this realization is nothing new. However, recent research gives a very thorough insight into how substantial trust is for the working of democracies (Putnam, 1993), growth of economies (Fukuyama, 1995; Knack & Keefer, 1997) and societies in general (Coleman, 1990; Sztompka, 1999).

But why do people trust? Economists and rational choice sociologists have a simple and distinct answer to this question, claiming that people maximize their own utility and, thus, trust when this decision entails positive expected outcomes (Coleman, 1990). However, newer studies can show that people in trust situations do not behave like this. In fact, they even trust strangers, who have no reason to be trustworthy but have an incentive to exploit them (Berg et al., 1995; Fetchenhauer & Dunning, 2009, 2010a, 2010b). These studies, implementing a more psychological view on trust, emphasize that people might base their trust decisions on motivations apart from the maximization of utility.

The purpose of this paper is to test common explanations for trust behavior, namely: 1. house money effects (do people hand over money, because it is not their own money but a show-up fee?) 2. beliefs of trustworthiness (do people hand over money because they assume that most trustees will be trustworthy and will give them more money back?) 3. risk tolerance (do people hand over money because they are just risk seeking) 4. preferences for equality (do

people hand over money because they want the trustee to get an amount of money equal to theirs?) and 5. preferences for enlarging the pie (do people hand over money because this decision generally enlarges the total sum of money participants can receive in this game?)

When analyzing trust, economists as well as psychologists often use the investment game or the trust game (Berg et al., 1995; Eckel & Wilson, 2000, 2004; Fetchenhauer & Dunning, 2009). In a binary variation of the trust game, which was e.g. used by Fetchenhauer and Dunning (2009) and which we applied in this study, a trustor and a trustee are involved, who are interacting anonymously via an experimenter. The trustor can decide to either keep or hand over €5 to the trustee. If the trustor gives the money to the trustee, the experimenter quadruples the €5 so that the trustee receives €20 in total. Then the trustee has an opportunity to keep the whole amount, or to reciprocate by sharing the €20 equally with the trustor.

Following the economic theory of *homo oeconomicus* - that people *only* maximize their *own* utility (Persky, 1995) - the best strategy for trustees is to keep the entire money for themselves. And, in line with the *common knowledge* assumption, which claims that not only each participant is informed about the "best" strategy but also, that each participant knows that every other participant knows the best strategy etc. (Aumann & Brandenburger, 1995), trustors can anticipate the selfish behavior of trustees and, thus, rationally should not hand over any money.

Contradicting that logic, research shows empirically that a substantial percentage of trustors hands over its money in several variations of the trust game (Berg et al., 1995, Eckel & Wilson, 2000, 2004; Fetchenhauer & Dunning, 2009). So obviously, trustors do not behave in accordance with economic or rational choice theory – so

why do they trust? In the following we discuss five common explanations for that phenomenon.

4.1.1. Potential Explanations for Trust Behavior

Beliefs of trustworthiness. Considering the empirical results of trust games it is eye-catching that not only 40%-95% of trustors hand over money, but also that most trustees (70%-90%) prove trustworthy and give money back (Eckel and Wilson, 2004; Fetchenhauer & Dunning, 2009; McCabe, Rigdon and Smith, 2003). Could it be that trustors do not behave irrationally at all, but just maximize their utility by giving money away, because most trustees reciprocate trust and send back more money than trustors have initially sent to them?

This argumentation has one flaw - it reduces trust to observable behavior. But trust has also a cognitive component. This becomes clear when considering a multi-perspective definition of trust by Rousseau et al. (1998), who defined trust as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or the behavior of another" (p. 395). Researchers often infer that behavior and cognition correspond to another. This assumption is highly plausible and people do that in everyday life as well because behavior is the only information they can observe in most situations. Accordingly, most trustors would hand over money to trustees, because they consider most of the trustees as trustworthy.

However, Fetchenhauer and Dunning (2009, 2010a) showed that this is actually not true. They measured not only the behavior of trustors in several trust games, but also their estimations about the average trustworthiness of the trustees. Stable findings revealed that trustors underestimate the trustworthiness of trustees by rates of 30-35 percentage points on average, however, most of them trusted (Fetchenhauer & Dunning 2009, 2010a). Evidently, people are too cynical when estimating the trustworthiness of others. Hence, they

do not hand over money because they consider this as a safe bet. It seems very odd that people express a high cynicism about others on the cognitive side, but show high trust on the behavioral one.

Risk tolerance. People underestimate the trustworthiness of others by a substantial amount; but is it possible that the underestimated rates of trustworthiness are still high enough for people to hand over their money because they are just risk seeking? This can only be true, if people base their decisions in trust situations on the perceived risk.

The recent literature strongly denies that. Eckel and Wilson (2004) as well as Ben-Nur and Halldorsson (2010) did not find a relation between participant's general risk attitudes and their decision to trust in a trust game. Houser, Schunk, and Winter (2010) replicated this finding applying a variation of the trust game. Moreover, Fetchenhauer and Dunning (2010b) pointed out that people`s decision to trust is not only independent of their general risk attitudes, but also of the specifically perceived risk in trust situations. Hereby, they showed that people react quite sensitively on risk in ordinary risk situations but quite insensitively in trust situations. Summarized, risk attitudes can neither explain why people trust on a behavioral level but distrust on a cognitive one, nor seems trust to be a decision that is related to risk at all.

House money effects. The findings of the last paragraph strongly contradict the conjecture that trust is a pure risk decision and, therefore, the economic or rational choice approach to trust. However, we think that these findings could be biased because in past studies that focused on explanations for trust behavior trust games were always conducted with money that fell in participants' laps. Yet, in real life situations people rarely have to make decisions with money that has just been handed to them and it should feel differently to decide about your very own money. Thaler and Johnson (1990) as well as Weber and Zuchel (2001) showed exactly that;

people are much more risk-seeking with given money than with their own.

Furthermore, trustors might feel coerced to go for the risky option with given money because they could think that the experimenter wants them to take part in the trust situation. So, they would perceive the show-up fee from the beginning not as regular money, but as money which was assigned to a special purpose and behave in the assumed social desired way. Finally, trustors could conceive it as boring to just rake in the show-up fee. Thus, they would hand over money because the thrill to take part looms larger than the loss of some play money.

Thus, it is possible that trustors in former studies just handed over money because they were playing with *house money*. That could also explain why former studies found big differences between trust on the cognitive side (estimates of trustworthiness) and the behavioral side (percentage of trustors who handed over money). According to house money effects, trustors indeed anticipated to lose their money when handing it over, however, they just did not care to lose that house money. Therefore, we want to examine whether the findings discussed above are still valid in the absence of house money, when participants have to make decisions with their own money.

Furthermore, we want to address two explanations for trust behavior that – to the best of our knowledge - have not been tested in the literature so far. These explanations refer to the fact that in trust games, different to other risky situations, another person is involved. Though, maybe just the existence of this other person is the reason why so many trustors hand over money in this paradigm. That should be the case, if trustors care about principles of distributive justice; but, which decision of a trustor can be considered as just?

Preferences for equality. The literature distinguishes various principles which can be consulted in distributive decisions. Accordingly, goods can be distributed according to equity, equality,

needs, effort, input relations and other principles (Adams, 1965; Deutsch, 1975). However, to decide which principle to apply in a trust game should be quite simple. In this game two persons are involved; none of them expends any effort or gives an input, furthermore, a certain amount of money falls into the lap of one of them (the trustor). Therefore, it is reasonable that trustors apply the rule of equality because other principles of distributive justice, such as need or equity, do not seem applicable to the presented situation. However, if the trustor keeps the money equality cannot be accomplished – the trustor will go home with the show up fee and the trustee with nothing. Only if the trustor hands over the money, there is the chance that both will go home with the same amount of money - that is when the trustee shares the received money equally.

Enlarging the pie. In addition, in some studies by Fetchenhauer and Dunning (2009, 2010a, 2010b) some of their participants told them that they handed over their $5 in a binary trust game because that way “at least somebody has the $20” (oral communication). Could it be that participants wanted to act altruistically to *enlarge the pie* of payments and happiness, ensuring that $20 was distributed to individuals in the study regardless of whether they shared in this bounty? Within behavioral economics Becker (1974) argued that many patterns of economic choices can be explained by assuming an altruistic motive to enhance the outcomes of all. This motive is reconsidered in the recent economic literature as preferences for efficiency (Charness & Rabin, 2002; Coate, 1995; Engelmann & Strobel, 2000; Fehr & Schmidt, 1999; Rotemberg, 1994). Following this logic, choosers should indeed hand over their money because that behavior increases the common pie to $20, which is considerably more than the $5 distributed if the chooser decided to keep the money.

4.1.2. Testing Explanations for Trust Behavior

To test all the described explanations for high trust rates, we applied 3 risky situations in this study in which participants could bet money. However, whereas participants ordinarily take decisions for given money in experimental studies, here participants had to make all decisions for their own money. First, this design controls for house money effects and second, it is much closer to real life situations in which people rarely take decisions for given money,.

The binary trust game with own money. In line with Fetchenhauer and Dunning (2009) we applied a binary variation of the trust game in which the trustor can keep or hand over own €5 to a trustee. If the trustor gives the money to the trustee, the amount of money is increased by €15. The trustee receives €20 in total and then has an opportunity to keep the whole amount, or to reciprocate by giving back €10 to the trustor. The trust game has been conducted in a number of studies, however – to the best of our knowledge - we are the first ones who conducted it with participants' own money. That change can shed light on the validity of two explanations.

First, it rules out house money effects. That could affect trustors' cognition as well as behavior. As related to cognition, it could be the case that trustors, who play the trust game for own money, become more risk averse. To lose own money should be much more painful than to lose a given show-up fee. Therefore, tustors could be prone to rationalize their risk aversion by keeping their own money because: "most trustees are untrustworthy anyway" and, thus, would become even more cynical regarding the trustworthiness of trustees. That is also what the management error theory would predict (Hasselton & Buss, 2000). When participants play for their own money, it becomes relatively more costly for them to trust an untrustworthy person (type II error) than to distrust a trustworthy one (type I error). Therefore, it would make sense that people become more cynical. However, if house money effects do not have an effect

on the cognitions of trustors, we should find equally high rates of cynicism like in former studies.

Entirely ambiguous is what kind of influence the change from given to own money has on the behavior of trustors. Again, trustors might become more risk averse and hand over much less money to trustees. In line with this argumentation, Dittrich and Ziegelmeyer (2005) found in a design of the gift exchange paradigm, in which participants had to use own money, dramatic effects of risk aversion. That means participants who could lose *own* money were much more risk averse in their behavior than those who could not lose own money.

However, it is also possible that more instead of fewer trustors could hand over money. Schlösser, Fetchenhauer and Dunning (2010) found that trustors were strongly influenced in their decision by their immediate emotions they had right at the moment they made their decision. These immediate emotions could be stronger when participants bet their own money and the decision is more realistic. In line with this, Fetchenhauer and Dunning (2009) found that trustors, who had to work for the money they could hand over in a trust game, trusted significantly more often instead of trusting less often than trustors who made a merely hypothetical decision.

Finally it is possible that we will not find any difference to former trust rates at all. In line with that an influence of house money could not be shown in former studies with all kinds of risky decisions. It is f.i. unclear whether house money has an effect in public good games or not (Cherry, Kroll, and Shogren, 2005; Clark, 2002; Harrison, 2007).

Second, our design also rules out that trustors hand over money because they want to accomplish equal distributions. In former studies, in which money fell into participants' laps, property rights were ambiguous and equal payoffs seemed to be fair. However, if participants are about to hand over *own* money, property rights are

clear and, additionally, only keeping the money can lead to an equal distribution (€0/€0). If the trustor hands over his own money (€-5) and the trustee reciprocates, the trustor gets €10 back and goes home with €-5 + €10 = €5, but the trustee with €10. Even worse, if the trustee keeps the money, he will go home with €20, but the trustor with a loss of €5. Thus, we not only rule out equality, in fact, a preference for equality should even influence trustors to rather hand over no money in our design to end with €0/€0.

The coin flip. Do trustors hand over money in the trust game because they are just risk seeking? To answer this question we have to know how risk seeking people are. To measure this, we gave participants the choice to bet €5 on a coin flip. In this paradigm participants can either keep their own €5 or bet these on the flip of a coin. If they win, they receive €10 from the experimenter. If they lose, they lose their €5. In the coin flip the objective chance of doubling the money is 50%.

Past studies concerning the trust game showed that trustors perceive about 50% of trustees as trustworthy (Fetchenhauer and Dunning 2009, 2010a). Thus, both paradigms seem to be generally comparable in matters of perceived risk. On condition that trustors also estimate the percentage of trustworthy trustees to be about 50%, we can make the following hypotheses:

If high rates of handing over money are explainable by high risk tolerance, we should find similar rates of risky decisions in the coin flip and the trust game. If people perceive trust games generally as risky situations, but care about equal distributions, we should find even lower rates of risky decisions in the trust game than in the coin flip. As mentioned above, handing over own money in our trust game leads unavoidably to unequal distributions for trustors, whereas participants attending the coin flip do not face that problem.

Furthermore, the coin flip is used as a reference point for the paradigm that is introduced in the next section.

The extended coin flip. To control whether trustors, who hand over money in trust games, want to *enlarge the pie* we introduced the extended coin flip. In this setting a participant can keep €5 or bet these on the flip of a coin. Again the participant can lose his €5 or get €10 from the experimenter. But in difference to the ordinary coin flip, in the extended coin flip another person, the beneficiary, is involved. Participants are told that when they bet their money and win, the beneficiary will receive €10, too. In the case that they bet their money and lose, the beneficiary will receive €20 and if they keep their money, the beneficiary will receive nothing.

Thus, outcomes in the trust game and the extended coin flip are exactly the same for both involved participants. That means people that hand over money in the trust game because they want to *enlarge the pie*, should do so to the same extent in the extended coin flip. If *enlarging the pie* is only a part of the explanation for trust behavior in the trust game, we can measure through a comparison of the ordinary and the extended coin flip how big the influence of this motive is. Because the extended coin flip differs from the ordinary coin flip only with respect to the second person involved, the difference in rates of risky decisions between both paradigms must be due to the motive of *enlarging the pie*.

4.2. Methods

In a between-subjects design overall we collected 425 decisions of participants overall in three conditions: the binary trust game, the coin flip and the extended coin flip. Material used was thoroughly pretested to ensure best comprehensibility. The study was divided into three steps.

4.2.1. Decisions of trustees

In the first step, 106 decisions of students from the University of Cologne were collected, who took a decision in the binary trust game as trustees. Participants had to fill in three 3 control questions

that checked whether they understood the decision they should make and the consequences of their behavior. We had to exclude 8 participants from the analysis because of incomplete questionnaires or wrong control questions. The 98 remaining participants (70 female) were on average 23.51 years old (*SD*=2.68). They were surveyed during a lecture. All decisions were collected via a questionnaire that ensured total anonymity by a password. The questionnaires first introduced the paradigm to participants and controlled for understanding via the control questions. Then participants should take their decision as the trustee and indicate whether they would keep €20 or give €10 back, when receiving money from the trustor. Participants were assured that their decision would become real once the randomly assigned trustors would have made their decisions within the next 6 weeks.

4.2.2. The lab experiment

In the second step, 319 participants were approached at the campus of the University of Cologne. Of these 319 participants we had to exclude 23 from analyses because of incomplete questionnaires or wrong control questions. The remaining 296 participants (207 female, 1 n.a.) were on average 23.6 years old (*SD*=2.98). They were invited to our lab and told to bring *own* €5 because they would get the possibility to make a monetary decision with this money. In the lab, participants were welcomed and randomly assigned to one of the three conditions (between-subjects). That means they got a questionnaire containing the binary trust game or the ordinary coin flip or the extended coin flip. Participants then filled out their assigned questionnaire in a booth. Again, all questionnaires first indicated that the following decision is about the participant's *own* money and that participants risk to lose their own money. Furthermore, it was stressed that participants *can*, but do not have to bet their own money. After that, the questionnaires explained the situation to the participants, then controlled for

understanding via three control questions and asked for their actual decision in the next step. Finally, demographical data was collected.

In the trust game participants first had to estimate the percentage of trustworthy trustees who would share the €20 equally versus the percentage of trustees who would be untrustworthy and keep the entire €20 for themselves. Then they had to take their decision as trustors and indicate whether they wanted to keep their own €5 or hand over this money to an unknown trustee. Participants were told that the decisions of the trustees had already been collected and that they would be randomly assigned to a trustee, if they hand over their money.

In both coin flip settings participants should indicate whether they want to bet their money on the flip of a coin. Participants were told that the coin flip would take place at the end of the experiment no matter how they decided.

Furthermore, in all questionnaires participants were asked for their *subjective* beliefs to double their money when going for the risky option. These were measured by a 7 point scale (1 = *I am totally sure I would lose my €5, when I bet (hand over) the money;* 7 = *I am totally sure I would double the €5, when I bet (hand over) the money*).

All participants were paid immediately after the experiment. Through a system of passwords and envelopes neither other participants nor experimenters knew how the single participant had decided and whether he got money or not.

4.2.3. Payout for trustees

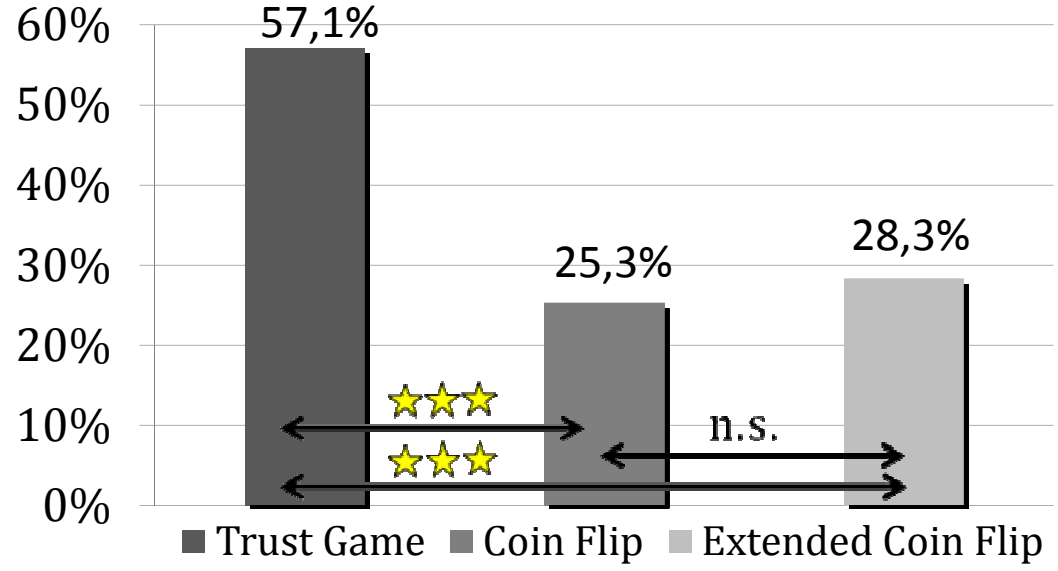
In the last step of the experiment, trustees that were randomly assigned to trustors who had handed over their money were paid accordingly. To ensure total anonymity, the money was distributed through closed envelopes, which were only marked with the personal passwords of trustees. Trustees had to indicate their password to get

their envelope. Also the beneficiaries in the extended coin flip were randomly selected from a lecture and paid.

4.3. Results

House money effects. In the introduction we pointed out that former studies repeatedly showed that people express high risk tolerance in trust situations although they are much too cynical about the trustworthiness of their interaction partners. Is this a stable phenomenon connected to the situation of trust or rather an artifact of house money effects? To give an answer to that question we introduced a trust game in which participants could only hand over their own money. Hereby, our first question was whether trutors would hand over own money at all. A majority of trustors (57.1%) gave away their money to an anonymous trustee (see Figure 1). Thus, despite the fact that trustors had to hand over own money we found trust rates comparable to those in former studies, where participants could hand over the show-up fee. (e.g. Fetchenhauer & Dunning, 2009, 2010a).

Figure 1: Percentage of participants who chose the risky option in the trust game, the ordinary coin flip and the extended coin flip

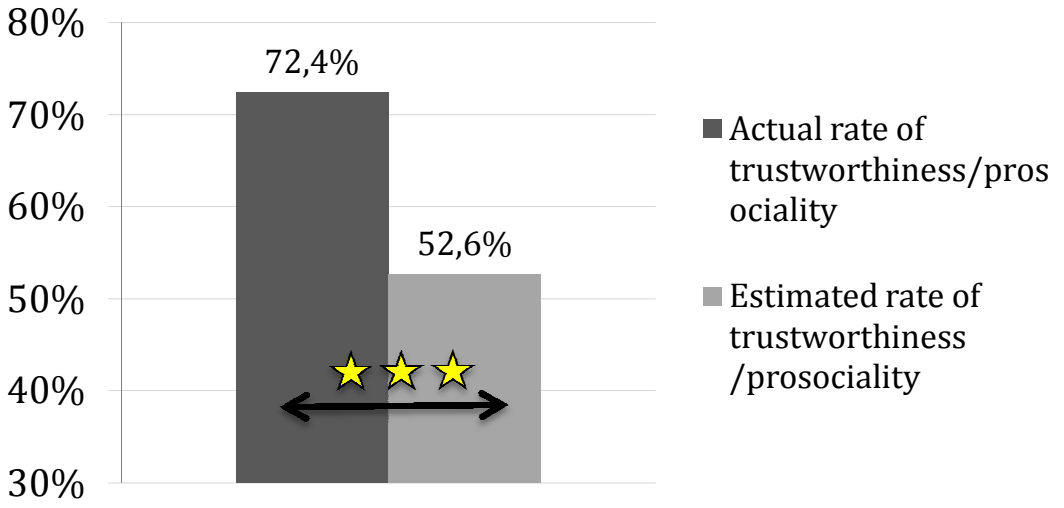


*Note: *p < .1; **p < .05; ***p < .01*

Beliefs of trustworthiness. Also trustors' cognitions were in line with past studies. Trustors thought on average that only 53.1%

(*SD* = 24.32) of the trustees would give back money. As Figure 2 shows, this was significantly less ($t(96) = -7.81$, $p < .01$) than the actual share (72.4%). In a nutshell, participants were not able to recognize how trustworthy others are in reality, although this realization was highly incentivized by own money.

Figure 2: Estimations of trustworthiness of trustees in the trust game in comparison to the actual behavior of trustees



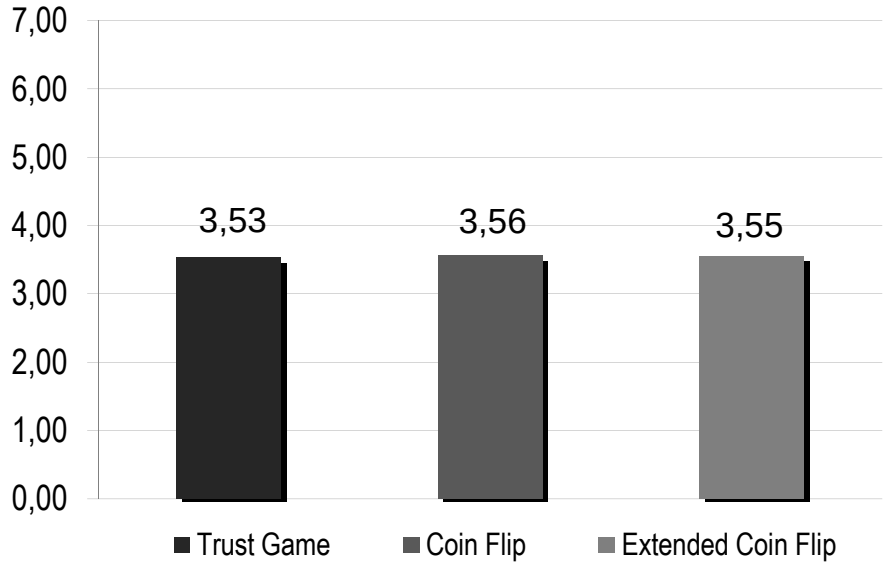
*Note: *p < .1; **p < .05; ***p < .01*

Risk tolerance. Most trustors in the trust game handed over their money although they were very cynical about the trustworthiness of the trustees. Is it possible that the estimated trustworthiness of 53.1% and, therefore, trustors' estimated individual chance of getting €10 back was high enough to hand over their money because it fulfilled their required minimal winning chance? To answer this question we introduced the coin flip as a pure risk decision without any trust involved. However, we first had had to ensure that the trust game and the coin flip were perceived as similar in terms of risk before we could compare them.

A one-sample t-test revealed that the chance of winning (50%) in the coin flip was not significantly different to the estimated percentage of trustworthy trustees (53.1%) in the trust game, $t(96) = 1.27$, *n.s.* This result was reflected in the subjective beliefs, too. Participants in the coin flip on average estimated their subjective

chance of winning with 3.56 (*SD*=1.01) on the 7 point scale (see Figure 3). A t-test showed that this value did not significantly differ ($t(195) = -.15$ *n.s.*) from the average belief of being assigned to a trustworthy trustee in the trust game (3.53). Thus, participants estimated and perceived the risk in the trust game similar to that one in the coin flips.

Figure 3: Subjective beliefs about the chance of doubling money in the trust game, the ordinary coin flip and the extended coin flip



Contradicting the hypothesis that trustors *bet* their money in the trust game because they were generally risk seeking, we found significantly fewer participants that bet money in the coin flip (25.3%) than trustors that handed over money in the trust game (53.1%), χ^2 (1, n = 197) = 20.69, $p < .01$. Indeed, the relationship between the estimated trustworthiness and the decision to hand over money was rather weak in the trust game, ($r(98) = .24$, $p < .05$).

Preferences for equality. We also used the results from the last section to shed light on the question whether trustors handed over money because they had a preference for equality. Preferences for equality should have influenced trustors to be even less risk seeking than participants in the coin flip. Both paradigms shared the same risk but differed in the fact that handing over money in the

trust game led inevitably to unequal pay-offs. However, contradicting preferences for equality, as shown above, significantly fewer not more participants bet money in the coin flip than trustors handed over money in the trust game.

Enlarging the pie. Did trustors hand over money in the trust game because they wanted to enlarge the pie? To give an answer to this question we introduced the extended coin flip. Similar to the trust game, here, also another person benefited from the decision to go for the risky option. Thus, the extended coin flip was introduced as a risky decision void of trust, but involving social dependency. For the same reason why the coin flip was comparable to the trust game regarding the perceived chance of winning, the extended coin flip was, too. Again this was also reflected in subjective beliefs. On average participants estimated their subjective chance of winning with 3.55 (*SD*=1.05) on the 7 point scale. A t-test showed that these 3.55 did not significantly differ ($t(195) = -.09$, *n.s.*) from those in the trust game (3.53).

Although, the extended coin flip was comparable to the trust game in matters of perceived risk and payoffs, significantly fewer participants bet money in the extended coin flip (28.3%) than trustors handed over money in the trust game (53.1%), χ^2 (1, n = 197) = 16.77, $p < .01$. This finding strongly contradicted the possibility that high trust rates were caused by the motive to enlarge the pie only.

However, to test whether people were partly influenced by the motive to enlarge the pie, we had to compare the extended coin flip with the ordinary coin flip. Both paradigms only differed in the fact that in the extended coin flip a second person was benefitting when the participant bet his money. Thus, even a weak motive for enlarging the pie should have motivated more participants to bet money in the extended than in the ordinary coin flip. However, with 28.3% only slightly more participants bet money in the extended coin flip than in the ordinary one in which 25.3% bet their money. This difference was

not significant, (χ^2 (1, n = 198) = .23, *n.s.*). That means, we could not find any evidence for the suggestion that participants cared about the fact that in the extended coin flip the pie was enlarged when betting money.

4.4. Discussion

Which insight can be derived from this study, concerning the explanation of trust behavior in anonymous one-shot interactions and the phenomenon of trust in general? First, we can state that high trust rates in trust games are a very robust phenomenon and, second, we showed that these high trust rates can hardly be explained by the most common arguments the current literature provides. Beginning with the robustness of high trust, our study did not only replicate high trust rates but showed that they are replicable under very conservative and realistic conditions.

Past studies concerning explanations for high rates of risky decisions in trust situations often applied a design where participants could take continuous decisions (Ashraf, Bohnet, & Piankov, 2006; Cox, 2004; Berg et al., 1995). But in real life trust decisions are often dichotomous. You cannot decide to buy just a half of a camera on ebay, because you do not really trust the seller and in the same way you have to unrestrainedly trust the babysitter who should look after your children. That is why the binary choice design we applied in all settings should be closer to reality than former studies.

Additionally, participants in all settings made their decisions for real money, and, since no show-up fee was paid, had to use their own money. In our opinion it cannot be stressed enough that participants, who gave money away, not only ran the risk to take the time to come to our lab, spend about 45 minutes there and go home with no money, but to go home with €5 less than before. We think there is hardly any possibility to design more serious decisions for the participants.

Furthermore, in this study we examined a quite big sample size for every treatment to obtain robust results. We simultaneously controlled for alternative explanations in a strict between-subjects design in which every participant was only confronted with one decision in one paradigm without knowing about other paradigms.

Against this background, it is even more striking that we found not only a substantial amount of trustors, who handed over their money (57.1%), but also that rates of trust seem to be not different from these in past works (56.3% and 56.8%), where participants got money from the experimenter (e.g. Fetchenhauer and Dunning 2009, 2010a). Thus, our findings strongly suggest that behavior in trust games is not explainable by house money effects or by a lack of seriousness regarding participants' decisions.

We also could not find any evidence that other explanations we had tested can account for high trust rates. In line with past works, trustors were not able to anticipate the high level of trustworthiness of their interaction partners. Whereas trustors estimated that only 53.1% of trustees would be trustworthy, actually 72.4% proved to be. To find out whether trustors are just risk seeking, we introduced the ordinary coin flip as a simple measure of risk aversion. Since the perceived chance of doubling the money (53.1%) was not significantly different from the actual chance in the coin flips (50%), we were able to compare them. That only 25.3% of the participants bet their money in the coin flip showed that participants in general were rather risk-averse than risk seeking, given an analogous pattern of chances and outcomes. This result is frequently found in the literature and can be explained by the prospect theory (Kahneman & Tversky, 1979). Obviously, a high level of risk tolerance cannot explain high trust rates in the trust game.

In addition, people are not only risk averse, they are also ambiguity averse; that can be shown e.g. in the Ellsberg paradox (Ellsberg, 1961). Ambiguity aversion means that people prefer known

risks to unknown. Taking ambiguity aversion into account, even fewer participants should have handed over their money in the trust game (unknown risk) compared to the ordinary coin flip (known risk of 50%). From this perspective the fact that we found indeed double as high rates of risky decisions in the trust game underlines the strength of the phenomenon.

We could not find any indications that this difference was triggered by norms of distributive justice. If people had cared about equal distributions that were only achievable by keeping the money in the trust game, we should have found even lower rates of risky decisions in the trust game than in the coin flip. Thus, our data contradict the idea that high trust rates are caused by a preference for equal distributions.

The extended coin flip controlled for whether participants wanted to enlarge the pie. Our results showed that participants risk tolerance was significantly lower in the extended coin flip than in the trust game. Moreover, the percentage of risky choices in the extended coin flip was not even significantly higher than in the ordinary coin flip. Based on our finding, we have to conclude that norms of distributive justice cannot contribute to clarify the phenomenon of trust at all.

So far, the question why people trust is still a puzzle. However, in this study we have shown that a variety of common explanations – based on the rational approach to trust– can hardly contribute to unravel it. However, when a rational approach fails to explain trust behavior which approach is suitable?

Dunning and Fetchenhauer (2010) suggested that trust behavior is an expressive act rather than being based on consequential and instrumental considerations as the rational approach claims. They argueed that one should focus on the immediate rewards and goals the act of trusting itself entails to

understand trust behavior. This reasoning is based on two phenomena they have observed in different studies.

First, Schlösser et al. (2010) showed that emotions rather than expectations about future gains influence the decision to trust. Even more interesting is that in this study participants were influenced by their *immediate* emotions they had in the moment they decided to trust or distrust. However, the consequential approach would predict that participants should be first and foremost influenced by anticipated emotions. Anticipated emotions are predictions by the participants about how they would feel after each possible decision they can make and outcomes associated with it. Contradicting the consequential approach, anticipated emotions failed to predict trust.

Second, Dunning and Fetchenhaur (2010) found out that a minimal relation between trustor and trustee is a necessary prerequisite for high trust rates. Hereby, it was enough to tell trustors that a specific, but anonymous, person is already assigned to them as a trustee to trigger high trust rates. If, in contrast, trustors were told that they are not assigned to a specific trustee, trust rates dropped substantially. Dunning and Fetchenhauer argued that being placed in a relationship – even this relationship is minimal– can trigger expressive concerns instead of consequential ones.

Dunning and Fetchenhauer (2010) concluded that high trust rates might be based on norms that trustors hold and which are evolved to sustain harmony in complex societies in which interactions with strangers are frequent. Thus, trustors that hand over money in a trust game may be concerned about being nice rather than about the monetary outcomes of their decision. However, to this point it is unclear if trustors comply with a specific norm and what kind of norm that could be. Furthermore, trustors could be influenced by other expressive motives like perceiving oneself as someone virtuous who his trustworthy - even to strangers.

We recommend that further research should focus on expressive features of trust. This study, as well as earlier studies showed that already thoroughly examined consequential explanations for trust consecutively fail to account for that phenomenon. In contrast, the expressive approach, on which little research has been made to date, seems more fruitful to explain trust behavior.

5. Do people trust at any cost?

5.1. Introduction

When researchers analyze trust they typically bear social dilemma situations in their mind in which two interaction partners can be better off when one of them (trustor) trusts and the other (trustee) proves trustworthy (Coleman, 1990). The social dilemma in these situations arises from the fact that trustees can exploit the trustors by keeping the whole surplus of the interaction for themselves. Therefore, trustees have to decide between being reciprocal or selfish and trustors between a potential gain, with the risk of being exploited and no gain.

Situations like this can be frequently found in everyday life and business. One example is the second-hand car market. Both seller and buyer are better off, if a car is sold because the buyer values the car higher than the money he has to pay and the seller the money higher than the car. However, sellers have an incentive to conceal not directly obvious flaws of the car and, thus, buyers have to trust the seller that the car is not a lemon.

However, not long ago one author of this study became firmly aware that these are not the only kind of trust situations existing. He was ambling along the river Rhine when a neatly dressed man approached him. The man was desperate. He told our colleague that he had been on the way to a customer with his truck, however, he had lost his way and eventually had run out of fuel with no penny to his name. Our dear coauthor was in an awkward situation. Should he lend this stranger some money?

Undoubtedly, our coauthor was confronted with a trust situation but in difference to the first example he could not profit from being trustful. Thus, in the first example trust could be based on strategic considerations but not in the second one. Situations like this are void of the strategic element for trustors to be better off.

Other examples are donating to charity organizations or picking up hitchhikers. In these situations we cannot be better off but have to trust that the charity organization will not embezzle our money and that the hitchhiker will not rob us. Even though, such non-strategic trust situations seem to be quite present in everyday life, they have not, to the best of our knowledge, examined yet. Therefore, the purpose of this paper is to examine such non-strategic trust situations for the first time.

5.1.1. How to measure trust

When analyzing the phenomenon trust, the trust game is often used (Berg et al., 1995; Eckel & Wilson, 2000, 2004; Fetchenhauer & Dunning, 2009). In a binary variation of the trust game –also applied in this study– a trustor and a trustee are involved, who are interacting anonymously via an experimenter. The trustor receives a certain amount of money (f.i. €5) and has an opportunity to keep all the money or to hand it over entirely to the trustee. If the trustor hands over the money (€5) to the trustee, the experimenter multiplies this amount (here by 4) and hands it over to the trustee. Then the trustee has an opportunity to keep this increased amount (here €20), or to reciprocate by giving back half of it (here €10) to the trustor.

5.1.2. Trust Behavior

A rational and selfish trustee, who maximizes his own payoffs, should keep all money for himself in the trust game because he has no incentive to share money and cannot be punished for his egoistic behavior. In line with the common knowledge assumption, which claims that each participant knows the "best" strategy in a decision scenario as well as that each participant knows that every other participant knows the best strategy etc. (Aumann & Brandenburger, 1995), trustors can anticipate the behavior of trustees and, thus, should not hand over any money. However, empirically it can be shown that most trustees behave trustworthy in that game and about

50% percent of trustors hand over money to trustees. (Berg et al., 1995, Eckel & Wilson, 2000, 2004; Fetchenhauer & Dunning, 2009, 2010a, 2010b).

5.1.3. Is trust strategic?

Do people trust strategically and hand over money in the trust game because they anticipate getting more money back? Findings of the current literature deny such reasoning. First, trustors usually underestimate the trustworthiness of trustees by about 30-35 percentage points (Fetchenhauer and Dunning 2009, 2010a). Second, various studies showed that high trust rates cannot be explained by high risk tolerance (Eckel & Wilson, 2000; Fetchenhauer & Dunning, 2009, 2010b; Houser et al., 2010) Fetchenhauer and Dunning (2010b) explained these findings with a phenomenon that we call *distrust aversion* here (see also Dunning and Fetchenhauer, 2010). They argued that emotions rather than rational considerations could explain trust behavior. Accordingly, people feel bad when signaling distrust openly, but feel good when trusting.

The influence of strategic motives on trust has not been tested *directly* hitherto. We provide such a direct test in this study by comparing an ordinary trust game to a non strategic trust game, which we designed particularly for this study. The ordinary trust game was similar to the trust game described above except the fact that trustors did not get a show-up fee that they could hand over to a trustee but could only hand over their own money.

In the non strategic trust game, trustors again could decide to hand over own €5 to a trustee or to keep that money. However, if they handed it over, the experimenter did not quadruple the money, but only doubled it and handed in total €10 to the trustee. The trustee had then the opportunity to keep all the €10 for himself or to share that money equally with the trustor. Regarding our examples in the introduction, this setting resembled real live situations like picking up hitchhikers or donating money to a charity organization. If people

only trust because they expect to be eventually better off by trusting, people should not trust in non-strategic trust situations. However, if people feel bad by showing others distrust, as argued by Fetchenhauer and Dunning (2010b), still substantial trust rates should emerge in non-strategic trust situations.

Finally, we go one step further and explore how far distrust aversion (if existing) can push people to risk being worse off, than before. In non strategic trust situations people can easily rationalize their decision to trust by telling themselves that they will break even when trusting. To give no room for such rationalizing, we introduced a trust game in which trustors could only be worse off when trusting another person. Still trustors had the opportunity to keep or hand over own €5 in this setting. However, in contrast to the ordinary as well as non strategic trust game this money was not increased, if handed over to the trustee. Trustees that received €5 could decide to keep all €5 or to give back €2.5 to the trustor. In this paradigm it was explicitly spelt out to trustors that their trust would entail costs, namely €2.5 in the best and €5 in the worst case. Moreover, the fact that trustors could only hand over their own money, they brought to the experiment, should have made the costly nature of this trust game particularly salient for them. This trust game was not introduced to resemble real life situations, but to prove our argument. Only if people are strongly distrust averse, we should find people who still trusted in this very extreme trust situation.

Both situations will give us also a more thorough understanding of how participants react on changes of potential gains in trust situations. Fetchenhauer and Dunning (2010b) showed that people react sensitively on risk in ordinary risk situations but quite insensitively in trust situations. We want to examine here whether people react to changes in potential gains in trust situations as insensitive as on changes in risk.

Apart from the behavior in non strategic trust games we also want to explore whether the estimations of trustors about the number of trustworthy trustees change with changes in potential gains.

To be sure that the trust rates in all trust games were due to the special features of a trust situation, we assigned each trust game one lottery equal in risks and potential gains. That means that we also had to introduce lotteries in which participants could not win money (just got their own stakes back in the case of "winning") or even only lose own money. We expect to find that only very few participants bet money in lotteries that entailed no gains, and no participants that bet money in lotteries with negative outcomes.

We want to stress that in all games we applied in this study, participants made their decisions for own money and not for a show-up fee like in former studies entailing trust games or lotteries. We did that because past studies showed that participants behave more risky with money just handed to them since participants consider such money as *house money* (Thaler and Johnson, 1990; Weber and Zuchel, 2001). Our design did not only rule out house money effects, but also made the decisions of participants much more realistic. In addition, our design provides a much more conservative test of our hypotheses for two reasons. First, it should feel much worse to lose own money than a show-up fee. Second, if participants receive a show-up fee, they could feel coerced to hand over this money. They may assume that the experimenter has given them the show-up fee for the purpose to take part in the trust game and might behave in accordance to the presumed social desired way. If, in contrast, participants have to hand over their own money they should not feel obliged in any way to hand over money.

5.2. Method

5.2.1. Participants

In total, 561 students of the University of Cologne participated in this study. Of these, 135 were excluded from the analyses because they did not complete the questionnaire, failed to answer the control questions correctly, or were assigned to participants with incomplete questionnaires or incorrectly answered questions. Of the remaining 426 participants, 246 were female and 180 were male.

5.2.2. Procedure

The experiment was divided in three steps. In the first step, 189 students of the University of Cologne from 4 different lectures filled out questionnaires. The randomly distributed questionnaires contained one of 3 variations of a trust game in which a trustor could hand over his *own* €5 to a trustee. Trust games varied in the factor (k) that determined how many times the €5 were multiplied by the experimenter, if trustors handed over the money to the trustee. Participants were confronted with games implying k-factors of 4, 2 and 1. Accordingly, in these games trustees could keep or share equally €20, €10 or €5 resp. when trusted by trustors. Then participants' understanding was checked via 4 control questions. Finally, participants should make a decision as the trustee and indicate whether they would keep €20 (€10, €5) or give €10 (€5, €2.5) back, if they got money from a trustor. Participants were informed that they would be randomly assigned to an anonymous trustor, who would make his decision within the next weeks. Thus, their decision became real when their assigned trustor handed over money. Participants were assured that they would get their money in 4 weeks. To ensure anonymity all participants were only identified by a personal password.

In the second step we conducted the main experiment featuring a 3 (k-factor 1 vs. 2 vs. 4) x 2 (trust game vs. lottery) factor between-

subjects design. 372 participants were recruited at the campus of the University of Cologne. They were told to bring €5 along that they *could* use for a monetary decision. In the lab, groups of 3-12 participants were randomly assigned to one of the six conditions. Participants were seated in booths and had to fill out questionnaires in which we emphasized that they *can* but *do not have to* bet their *own* €5 in a subsequent decision. Again, a personal password assured anonymity.

Participants who were assigned to a trust game faced one of the 3 trust games with k-factors of 1, 2 or 4, respectively. Again, first the paradigm was introduced followed by control questions. Then participants should estimate which percentage of people would share money in the position of the trustee as well as which percentage would keep all money for themselves. Participants were reminded that both percentages must add up to 100%. The estimated percentage of trustworthy trustees can be interpreted as the trustor's believed chance to get money back from the trustee. Hereafter, they were informed that they would now make a decision as the trustor and that the decisions of the trustees had been already collected. Participants were explained that they would be randomly assigned to one trustee and immediately given any returns from the trustee, in the case they would hand over their own €5. Trustors assigned to an untrustworthy trustee always lost their money. However, trustors assigned to a trustworthy trustee handed over €5 and got €10 back (net gain €5) in the k=4, €5 (net gain €0) in the k=2 and €2.5 in the k=1 (net loss €2.5) condition. Before they made their decision to keep or to give their money away they had been asked for their *subjective beliefs* to be matched with a trustworthy trustee. Subjective beliefs were measured through a 7 point scale (1 = *I am totally sure I would be assigned to a person that gives me €0 back, when I handed over my €5*, 7 = *I am totally sure I would be assigned to a person that gives me €2.5/€5/€10 back, when I handed over my €5*).

In the lottery conditions, participants could bet their own €5 on the throw of two ten-sided dice of which one was black and the other one white. Participants were explained that at the end of the session the dice would be thrown whereby the dice would assemble a number between 1 and 100. Hereby, the black dice generated the ten's (first digit) and the white dice the unit (second digit). The combination 00 counted as 100. Furthermore, each participant received a personal winning number between 0 and 100 determining their chance to win the lottery. They won the lottery, if a number smaller or equal to their personal winning number was thrown. They lost the lottery, if a number higher than their winning number was thrown. A participant that had f.i. the winning number of 76 won the lottery, if the dice showed any number between 1 and 76 and lost the lottery, if the dice showed any number between 77 and 100. To determine the winning numbers we randomly assigned each lottery to one trust game that was conducted beforehand. The winning number for each lottery was then determined by the estimated percentage of trustworthy trustees that was indicated by the trustor of the assigned trust game. With this procedure we ensured that for each trust game an equally risky lottery was conducted. Also the stakes of each lottery were fitted to the assigned trust game. Like in the trust games, participants in all lotteries lost their €5, if they lost the dice throw. However, if they won, their gain was dependent on the k-factor of the trust game they were matched with. In lotteries matched with k=4 trust games, participants got €10 back from their €5 (net gain = €5), if they won. Lotteries matched with k=2 trust games yielded €5 (net gain = €0) in the case of winning and lotteries matched with k=1 trust games €2.5 (net loss €2.5).

Analogous to trust games, first the paradigm of the lotteries was introduced to participants followed by control questions. Then they should indicate their subjective beliefs to win their lottery on the same 7-point scale applied in the trust game. Hereafter, participants made their decisions.

In both paradigms, the trust game and lottery, participants were immediately paid after the experiment. Through a system of passwords and envelopes neither other participants nor experimenters knew how the single participant decided or whether money was returned or not.

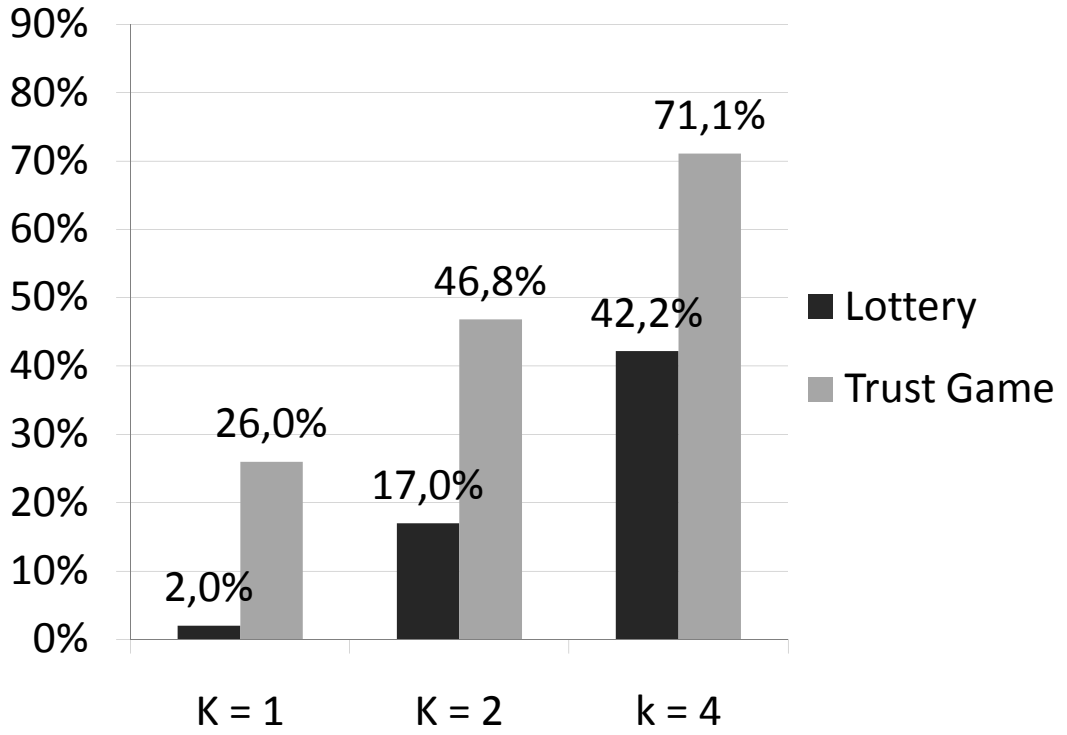
In the last step of the experiment, trustees were paid that had been randomly assigned to a trustor that had handed over his money. The money was distributed in closed envelopes, which were only marked with the personal passwords of trustees, to ensure total anonymity. Trustees had to indicate their password to get their envelope.

5.3. Results

5.3.1. Number of Risky Decisions in Trust Games and Lotteries

The main question of our study was whether people trust strategically or not. We pointed out that we should not find any participants that trusted in the k=1 or k=2 condition, if our participants' decisions were based on strategic considerations only. We also introduced a coin flip as a risky decision void of trust, in order to attribute potential trust rates in all trust games to the special features of a trust situation. Figure 4 summarizes our findings.

Figure 4: Percentages of risky choices in trust games and in the lotteries



At a first it is eye-catching that overall more trustors went for the risky option than participants in the lotteries as well as that risky options in both setting decreased with decreasing k-faktors. A logistic regression with the decision to bet/hand over money as the dependent variable and the k-factor as well as the kind of game as independent variables could support this impression. The main effect of the paradigm (OR = .3, p < .01) as well as the k-factor (p < .01) was significant (see Table 1).

Table 1: Summary of binary-logistic regression with the trust game and k=1 as reference category

Model	B	SE	Wald	OR
Lottery	-1.21	.45	7.4***	.3
k-factors			17.88***	
k=1	-1.95	.46	17.87***	.14
k=2	-1.03	.44	5.46**	.36
k*Paradigm			2.01	
k=1 by Paradigm	-1.63	1.15	2.01	.2
k=2 by Paradigm	-.24	.66	.13	.79
Constant	.9	.33	7.5***	2.46

*Note: Significant effect on the decision to bet money: *p < 0.1 **p < 0.05 ***p < 0.01*

Explained pseudo variance: Nagelkerke's R^2 = .31

Considering the single conditions we found that in the coin flip 19 participants (42.2%) bet their money when they could double their stakes (k=4). However, only 8 people (17%) bet money in the k=2 condition, in which they could only get their stakes back, and only 1 participant (2%) bet money in the k=1 condition, in which participants could only lose money. In the trust game people behaved quite differently. Contradicting a strategic motivation of trustors, we observed not only high risk rates in the k=4 condition (32 participants or 71.1%) but also in the non strategic conditions, k=2 (22 or 46.8%) and even k=1 (13 or 26%) condition. Table 2 shows that in each k condition the number of risky choices was significantly higher to a 1% α-level in the trust games than in the lotteries.

Table 2: Overview of significant differences of risky decisions in the trust game and lotteries

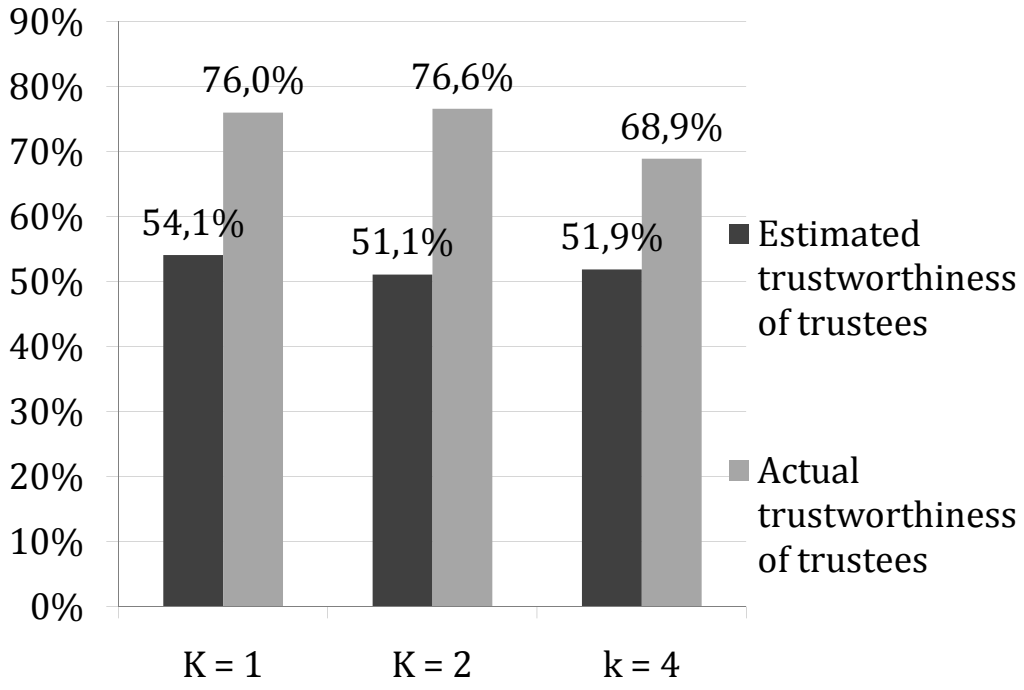
		Trust Games			Lotteries		
		k=1	k=2	k=4	k=1	k=2	k=4
Trust Games	k=1	----	$(1, n = 97) =$ $4.55, p < .05$		$(1, n = 100) =$ $11.96, p < .01$		
	k=2	----	----	$(\chi^2 1, n = 92) =$ $5.6, p < .05$		$(\chi^2 (1, n = 94) =$ $9.6, p < .01$	
	k=4	----	----	----			$(\chi^2 1, n = 90) =$ $7.65, p < .01$
Lotteries	k=1	----	----	----	----	$(\chi^2 (1, n = 88) =$ $6.5, p < .05$	
	k=2	----	----	----	----	----	$(\chi^2 (1, n = 92) =$ $7.04, p < .01$
	k=4	----	----	----	----	----	----

The findings of the last paragraph showed that the level of risk tolerance was higher in the trust games than in the equivalent lotteries independent of the k-factor. However, in the introduction we pointed out that it is possible to find not only higher levels of risk taking in trust situations than in ordinary risk situations but also a higher insensitivity to changes in potential gains. A quick look at the pure descriptive statistics in the paragraph above shows that risky choices declined by 15 to 20 percentage points in both, the trust game and the lottery for each reduction of the k-factor (4, 2, 1). Hence, we assumed that the k-factor influenced trust rates as well as gambling behavior to the same extend. Our logistic regression with the decision to bet/hand over money as the dependent variable and the k-factor as well as the kind of game as independent variables could confirm that impression. We found a significant ($p < .01$) main effect for the k-factor but no interaction effect of k-factor and paradigm (see Table 1).

5.3.2. Trustworthiness estimations

Former studies showed that most of the trustees were trustworthy in trust games and gave money back when they received some from the trustor. However, it was also shown that trustors were unable to anticipate that high percentage of trustworthiness. We wanted to find out whether this pattern holds true for non strategic trust games. Beginning with the behavior of the trustees, Figure 5 shows that between 68.9% and 76.6% of the trustees were trustworthy in our study.

Figure 5: Trustors' estimations of trustworthy trustees in the trust game in comparison to the actual behavior of trustees



*Note: *p < .1; **p < .05; ***p < .01*

A chi-square test revealed that the decision to be trustworthy was not significantly influenced by the k-factor (χ^2 (2, n = 142) = .65, *n.s.*). Thus, most of trustees gave money back when they received some from the trustor -no matter whether they participated in a strategic trust game or not. An ANOVA revealed that also trustors' estimations did not differ significantly $F(2,139) = .21$, n.s. However, trustors strongly underestimated the trustworthiness of trustees overall ($t(141) = -10.67$, $p < .01$) as well as in each single k-condition strongly (see Figure 5). This means, independent of the kind of trust situation trustors were facing, they were unable to anticipate how trustworthy their partners of interaction usually were.

5.3.3. Subjective beliefs of trustors and participants of lotteries

Through our design, trustors and participants in lotteries faced the same risks by handing over money and betting money respectively. However, participants might have been more risk tolerant in the trust games because the trust situations felt less risky

than lotteries. To shed light on this question we analyzed the subjective beliefs of doubling the money in the trust games as well as the coin flips. Participants attending the trust game indicated on average 3.87 (*SD* = 1.43) points on the subjective belief scale (1 = *totally sure to lose the money when handing it over*; 7 = *totally sure to double the money when handing it over*). This is almost the same value participants in the lottery indicated on average (3.81; *SD* = 1.48) and both numbers did not differ significantly, $t(280) = -.37$, *n.s.*

5.4. Discussion

Do people trust strategically? The answer is yes, but only partly. Admittedly, we could find a systematical influence of potential gains on the decision to trust. Whereas in the lotteries the amount of risky decisions decreased with lower gains to almost zero, trust rates were not as vulnerable to changes in expected gains. Even when people could only be worse off by trusting (k=1) a substantial amount of trustors (26%) handed over money. This percentage as well as the 46.8% of trustors who handed over money in the k=2 trust game cannot be explained by strategic motives. These main results are even more striking when taking a closer look at the other results as well as the design of our experiment.

First, participants who handed over money in the trust game were more than aware of their risk of losing money. In fact, they underestimated the trustworthiness of trustees by over 20 percentage points independent of the k-factor and, thereby, overestimated their risk to lose money. That means although trustors overestimated the chance of losing their money in the non-strategic trust games they handed it over.

Second, participants also did not perceive the estimated risks in the trust games and the objective risks in the lotteries differently. Trustors did not hand over money because they perceived trust games less risky than lotteries. In fact, there was no difference in the subjective beliefs of winning between trustors and lottery players.

Third, participants played the games with their *own* money in all paradigms. Thus, the potential costs of trust were as real as possible in our experiment and high trust rates cannot be explained by house money effects.

Fourth, trustors did not only bear real monetary costs. Before they could make their decision they had had to come to our lab and read questionnaires for about half an hour there. Even so, no trustor got upset by spending time for nothing. Contrary, a substantial rate of participants decided at the end of the experiment to make themselves dependent on a totally unknown second person while knowing that they can only lose money by this decision.

One might argue here that participants, who handed over their money, did not do this in spite of the non-monetary costs they had already borne before they could make their decision, but exactly because by bearing all these costs. Following that logic participants made a sense of all costs they incurred by convincing themselves that they were actually very happy to take part in this interesting experiment. However, to convince themselves properly, they had to hand over money. Indeed such self justifying behavior to reduce cognitive dissonance could be shown frequently in past studies (e.g. Festinger & Carlsmith, 1959; Kiesler, Nisbett, & Zanna, 1969). However, we can definitely refute this possibility. If high trust rates in the trust game were a mere dissonance phenomenon, we should have found same rates of risky decisions in the lotteries.

Fifth, the non strategic trust examples from everyday life, explained in the introduction, involved trustees in need (trucker out of fuel, donations). Participants in our lab even accepted costs for trusting a person not in need but in the very comfortable position to decide whether to take just half of the money or all of it.

Finally, people are ordinarily ambiguity avers (Ellsberg, 1961) and prefer known risks over unknown ones. Hence, we should have found risky choices in the lotteries in which the chances of winning

were precisely determined rather than in the trust games in which the risks were only guessed by trustors themselves.

In conclusion, our results showed, in line with past works, that people hardly trust on the base of rational considerations. Trust behavior differs from risk behavior and people even accept notable costs to avoid showing distrust towards others. Our examples in the introduction suggest that this likely holds true outside the lab. By the way, our coauthor that lent the needy trucker €50, has never seen back any of it.

The question remains, why people react insensitively on changes of risk in trust games (Fetchenhauer & Dunning, 2010b), but strongly on changes of mutual gains. One possible explanation is that the costly nature of a trust game is much more obvious for participants when the negative expected outcome of this trust game is accomplished through low potential gains than through a low chance of winning. In a trust game, in which a trustor can double his money with a chance of 40% and lose it with one of 60%, the expected outcome is negative, nevertheless he can still hope to double his money. In contrast, such hope is non-existent in a trust game in which a trustor can break even in the best case or lose it in the worst case. Based on the research of Dunning and Fetchenhauer (2010) we strongly assume that the variation of behavior with different styles of trust games, as well as the difference in behavior between trust games and ordinary risk decisions, is due to different emotions actors have in the moment they decide. Furthermore, we suggest that these emotions are at least partly based on how risk and trust situations are perceived. The awareness of potential gains and risks could play an important part here. Further studies, featuring a similar design to this study, but examining a larger variety of gain and risk combinations, as well as the emotions of people who decide in lotteries or trust games, could make a substantial contribution to the explanation of trust.

6. More nosy than regret averse? – Can curiosity explain high risk tolerance in trust games?

"The first and simplest emotion which we discover in the human mind, is curiosity"

(Edmund Burke, 1729 – 1797)

6.1. Introduction

Everyone deals with trust situations every day. We have to trust our romantic partner that he is faithful, our friends that they are there for us when we need them and our colleagues that they will stick to settled agreements. However, trust becomes even more important when we interact with unknown persons on one occasion only. When our partner, friends or colleagues are untrustworthy, they run the risk never to be trusted again and accordingly not to benefit from our trust relationship anymore. A car dealer or private seller on ebay has much less inhibitions to betray us, because he will presumably not interact with us again. However, these people at least risk their good reputation, too. On ebay f.i. we can rate sellers.

In contrast, when researchers examine trust experimentally, they mostly examine pure trust (Berg et al., 1995; Eckel & Wilson, 2000, 2004; Fetchenhauer & Dunning, 2009). They design situations in which participants interact anonymously and untrustworthy persons cannot be held accountable for their behavior by any means. A puzzling -and yet unexplained- finding of this research is that people are highly trustful in such situations. They rather hand over money to a stranger with the hope that this person will reward them for their trust than betting this money in a comparable lottery. Even more puzzling, they trust, although they underestimate the trustworthiness of their potential interaction partners crucially (Fetchenhauer & Dunning, 2009, 2010a).

In this study we want to find out whether people trust in such pure trust situations because they are curious. In the situations described above, people (trustors) that can trust another person (trustee), can only find out whether this person was trustworthy or not by trusting him or her. Thus, trustors might have behaved trustfully in past studies because they were just curious about how another person behaves in such a pure trust decision – information that they cannot capture in everyday life. Before we consider this curiosity hypothesis more thoroughly, the next section gives an overview about the current trust research and which explanations failed to account for high trust rats in the past.

6.1.1. Current Trust Research

The trust Game. Studies that examine trust experimentally often make use of the trust game (Berg et al., 1995; Eckel & Wilson, 2000, 2004; Fetchenhauer & Dunning, 2009). In a binary variation of that game a trustor and a trustee are involved, who are interacting anonymously via an experimenter. The trustors can decide to keep or hand over €5 to the trustee. If the trustor gives the money to the trustee, the experimenter quadruples the €5 so that the trustee receives €20 in total. Then the trustee has the choice to either keep the whole amount, or to reciprocate by sharing the €20 equally with the trustor.

The trust game was developed to test game theoretical predictions based on the idea of the *homo oeconomicus* that is a construct of economic theory. According to the *homo oeconomicus*, people only maximize their own pay offs because they are rational and egoistic (Persky, 1995). Following this idea, no trustee who receives money in a trust game should give money back to a trustor. An additional idea of economic theory is the common knowledge assumption, which assumes that every rational actor knows about the best strategy of every other actor (Aumann & Brandenburger, 1995). Therefore, trustors should be able to anticipate the behavior of

the trustee and, hence, should not hand over any money to the trustee.

In contrast to economic theory, a variety of studies has shown that 40%-95% of trustors hand over money in the trust game as well as that most trustees (70%-90%) prove trustworthy and give money back (Eckel and Wilson, 2004; Fetchenhauer & Dunning, 2009; McCabe et al., 2003). The current literature fails to explain why so many trustors hand over money - although a lot of explanations have been tested. The following paragraphs shall give an overview.

Explanations for high trust rates. When we consider the behavior of the trustors only, it is not immediately obvious that trustors behave in contradiction to economic theory. One could argue that only trustees behave irrationally because most of them give money back when entrusted by a trustor. However, trustors could anticipate these high rates of trustworthy trustees and would hand over money since they might expect to get more money back in return. Indeed trustors face quite good odds and have a 70-90% chance of doubling their money in the trust game.

Fetchenhauer and Dunning (2009, 2010a) have pointed out that this argumentation is an artifact of a narrow concept of trust that had been used in past studies. This concept claimed that trustors hand over money because they consider their interaction partner to be trustworthy. Fetchenhauer and Dunning (2009, 2010a) by contrast have distinguished between the behavioral act of trusting and the cognitive believe in the trustworthiness of others. In their studies trustors were indeed trustful on the behavioral level, but underestimated at the same time the number of trustworthy trustees by 30-35% percent points. Thus, trustors estimated that only about 45-60% would prove trustworthy whereas 70-90% actually did. These findings were replicated in this work in Chapter 4 and 5.

Yet, even if trustors underestimate the trustworthiness of trustees in general, the economic and strictly rational approach to

explain trust behavior could still be true. It could be that the estimated rates of trustworthiness are high enough for trustors to hand over money because they are risk seeking.

However, several studies showed that the understanding of trust games as risk situations like lotteries is generally flawed. Eckel and Wilson (2004) tried to predict the behavior of participants in a trust game by two behavioral risk measures. In their study, they could not find a statistical relation between the risky decisions and the decision to hand over money in the trust game. This result could be replicated by Ben-Nur and Halldorsson (2010) as well as Houser et al. (2010). Fetchenhauer and Dunning (2010b) designed an experiment in which participants could hand over $5 in a binary trust game as well as bet $5 in a lottery with the chance to lose or double the money (within-subjects). In addition, they manipulated between-subjects both the chance to double the money in the trust game by telling the trustors which percentage of the potential trustees was trustworthy as well as the chance of doubling the money in the lottery. In a first condition the chance to double the money was 46% in both settings and in a second condition 80%. They found much higher rates of risky choices in the trust game than in the lottery when the chance of winning was 46%. Furthermore, participants reacted very sensitively on changes in the chance of winning in the lotteries but rather insensitively in the trust games.

The studies presented suggest that classical economic theory assuming rational, egoistic and utility maximizing actors is not sufficient to explain trust. In Chapter 4 it was demonstrated that trusting behavior is not even explainable by economic theory, when these strict assumptions are relaxed. They argued that trustors might not only care about themselves when making decisions but also about consequences for others. To find out, they compared a binary trust game 1) to an ordinary lottery, in which participants faced the same potential gains and risks as in the binary trust game and 2) to

a lottery void of trust but featuring a second person involved as well as same risks and outcomes for both players as in the binary trust game. Contradicting preferences for second players, in Chapter 4 it was found an equally low risk tolerance in both lottery decisions and replicated a substantially higher risk tolerance in the binary trust game, which had already been found in earlier studies.

Furthermore, in Chapter 4 of the work at hand it was examined whether the results in trust games could be caused by a methodological flaw, the fact that trustors usually hand over given money in trust games. Thaler and Johnson (1990) as well as Weber and Zuchel (2001) found that people are more risk seeking with such house money. My coauthors and I argued in Chapter 4 that in past studies trustors possibly had not taken their decisions seriously because of house money effects. Hence, in the study presented in Chapter 4 participants had to bring their own money, which they could hand over in the trust game and did not receive a show-up fee. Still the trust rates found in this study were very similar to the trust rates found in studies that used *house money*.

In summary, the current literature cannot account for high trust rates.

6.1.2. The curiosity hypothesis

In this paper we want to test a very simple and parsimonious explanation for the phenomenon described above. We want to find out whether high trust rates are caused by curiosity that not only Edmund Burke in the introductory quote but also psychological research has described as a fundamental driver of human behavior (see Loewenstein (1994) for an overview).

When we refer to curiosity in this paper, we bear the psychological construct of curiosity in our minds, which has to be differentiated from the rational and strategic motivation to search for information. William James (1950[1890]), one of the first

psychologists, described curiosity as a "susceptibility for being excited and irritated by the mere novelty of … the environment" (p. 430). Thus, from a psychological point of view, curiosity is triggered by novel stimuli and driven by emotions. Furthermore, curiosity in turn functions as a motivational driver to explore and collect information about novel stimuli (Jones, 1966; Jones, Wilkinson, & Braden, 1961). Hereby, explorative behavior is only based on the urge to satisfy the aroused curiosity and not on rational considerations about how useful the collected information might be in the future (Loewenstein, 1994).

Like curiosity, a gap of information can also cause a rational and strategic motivation to search for information. However, in contrast to curiosity a rational search for information is neither based on emotions nor an end in itself, but based on the strategic consideration that the collected information will be more valuable than the costs of searching (Stone, 1992).

Trust behavior in trust games could be due to both motivations, curiosity as well as a rational search for information. Trustors experience a gap of information when they decide to keep or hand over money to a trustee. Trustors do not know how trustees behave in such pure trust decisions which do not appear in everyday life. To find out they have to hand over money to the trustee. According to the rational information-search perspective, trustors might understand the trust game first and foremost as an opportunity to buy information. They would "pay" €5 to learn how another person behaves in a pure trust situation, in which he or she cannot be held accountable in any way for being untrustworthy. Trustors would consider this as important information, which can help them in future trust decisions.

If, in contrast, trustors were influenced by curiosity, they would hand over money simply because they would have the emotional urge to expose themselves to this new and exiting situation.

Concluding, both motivations could explain why people rather hand over money in a trust game than bet this money in an equally risky lottery. In contrast to handing over money in a trust game, betting money in a lottery does not provide participants with the opportunity to learn something about the world. In addition, in lotteries the chance of winning vs. losing money is usually known. In Chapter 4 and 5 my coauthors and I compared risk behavior in trust games to risk behavior in coin flips. In a coin flip, all participants know that the chance of winning this coin flip is 50%. However, in the trust game trustors are confronted with an unknown risk: that means uncertainty or ambiguity. Participants can merely built expectations about the trustworthiness of trustees and, therewith, about the chance of doubling their money in the trust game. In Chapter 4 and 5 the fact that participants hand over money in trust games, although facing unknown risks, was taken as evidence that people's behavior must be strongly influenced by the element of trust in risky situations. Hereby, it was referred to the finding that people are not only risk, but also uncertainty averse (e.g. Ellsberg, 1961, Einhorn & Hogarth, 1985). It was argued that uncertainty aversion should cause that fewer rather than more participants hand over money in a trust game than in a lottery when the estimated, uncertain chance of doubling the money in the trust game is as high as the certain chance of doubling money in the lottery. However, in Chapter 4 and 5 it was ignored that uncertainty aversion and curiosity have the same root – a gap of information.

In the last paragraphs we pointed out that curiosity, as well as a rational motivation to search for information could explain high trust rates in trust games. However, with regard to the already discussed study of Fetchenhauer and Dunning (2010b), the claim that trustors hand over money because they are rationally searching for information seems unlikely. As described above, in this study trustors had been informed about the chance to be matched with a trustworthy trustee before they made their decision. Although

participants had this information, a larger percentage of them handed over money in a trust game than in a lottery with equal risks and stakes. This result contradicts that tustors "paid" €5 for the information how another person behaves in a pure trust decisions because they received the more valid base rate information for free. However, the design of this study did not rule out that trustors handed over money because they were curious and wanted to expose themselves to the situation of the trust game. A variety of studies showed that people often regard base rate information as not useful as well as that abstract statistical pieces of information have less impact on peoples judgment than more vivid ones (Borgida & Nisbett, 1977; Kahneman & Tversky, 1973; Wainberg, Kida, & Smith, 2010). Thus, trustors in the study of Fetchenhauer and Dunning (2010b) might nonetheless have been curious about the decision of their interaction partner, which they only received when they handed over their money.

Furthermore, in the study of Fetchenhauer and Dunning (2010b) the decisions of trustees had already been collected when trustors made their decisions. Research on curiosity showed that people become particularly curious about information that is "already out there in the world" (Loewenstein, 1994; Van Dijk & Zeelenberg, 2005). In addition, another study of Loewenstein, Adler, Behrens and Gilles (1992) revealed that people become more curios, if they get provided with pieces of the entire information (cited in Loewenstein, 1994). Thus, giving trustors base rate information could make them more curious about the decision of their interaction partner rather than less curious, although base rate information is more informative than interaction partner's feedback, from a rational point of view.

Testing our curiosity hypothesis, we applied a very simple design in this study featuring a binary trust game under two feedback conditions (between-subjects). Between both conditions we manipulated the kind of feedback trustors received in a binary trust

game about their assigned trustee. In the conditional feedback condition, trustor received only feedback about the decision of their interaction partner, if they handed over their money to him. In the unconditional feedback condition, we had informed trustors before they made their decision that they would learn the decision of their assigned trustee independently of their decision to keep or to hand over money. If trustors generally hand over money in trust games because they are curious about the decision of their trustee, we should find lower rates of trust in the trust game with unconditional than with conditional feedback.

6.1.3. The regret hypothesis

In contrast to the curiosity hypothesis it is equally possible that not fewer but more trustors hand over money under unconditional than under conditional feedback. We expect this finding, if people in trust situations are more regret averse than curious.

Bell (1982) pointed out that the potential experience of regret has to be considered in actors' utility function to get a better understanding of actors' decision in real life. Later, this idea could be supported empirically (Josephs, Larrick, Steele, & Nisbett, 1992; Van Dijk & Zeelenberg, 2005; Zeelenberg, Beattie, van der Pligt, & de Vries, 1996). In particular it was shown that people make regret-minimizing choices.

Applied to the situation of the trust game, trustors might be influenced by anticipated regret when they receive conditional feedback. They can choose between safe €5 and risky €10. If they keep the €5, they will never learn whether they would have doubled or lost this money, if they had handed it over to the trustee. Thus, they do not run the risk to experience future regret with this decision. If they hand over the money, they run the risk to regret this decision when they lose their €5. In contrast, under unconditional feedback trustors cannot avoid the threat of potential regret no matter whether they keep or hand over their money. If they hand over their money,

they run the risk to regret this decision when they lose their €5 just like in the conditional feedback condition. Trustors that keep their money, risk to learn that they would have doubled the money, if they had handed it over to the trustee. Thus, if people are rather regret averse than curious, we should find that more trustors handed over money under unconditional than conditional feedback.

In order to replicate former findings of high trust rates, as well as regret aversion, we also introduced a simple lottery paradigm (within-subjects). Participants in each condition should also indicate whether they want to bet €5 on the flip of a coin with the chance to double or lose this money. Again, in the conditional feedback condition, participants only learned whether they won or lost the coin flip, if they decided to bet money on it. However, in the unconditional feedback condition they were provided with this information independently of their decision.

The coin flip helps us to make sure that we replicate the basic phenomenon of higher risk tolerance in trust games than in lotteries. Past studies concerning the trust game showed that trustors on average estimate that about 50% of trustees will prove trustworthy (Fetchenhauer and Dunning 2009, 2010a). Thus, the perceived chance of doubling the money in the trust game was comparable to the objective chance of doubling the money in the coin flip in these studies. On the condition that trust game and coin flip are again comparable in matters of perceived risks in this study, we predict to find substantially higher rates of risky trust game choices than lottery choices in the conditional feedback condition.

Furthermore, we expect to find differently high rates of risky coin flip decisions between both feedback conditions caused by regret aversion. We assume that participants are not curious about the outcome of the lottery because they cannot learn anything from this information. However, participants should be influenced by regret

aversion. Thus, we expect to observe higher rates of risky lottery decisions under unconditional feedback than under conditional one.

6.2. Method

6.2.1. Participants

Participants were 182 students from the University of Cologne. We excluded 18 participants from the analysis because of incomplete questionnaires or wrong control questions. The 164 participants left in the sample (105 female) were on average 23.66 (*SD* = 3.41) years old.

6.2.2. Procedure

The experiment was divided into two steps. In step one, participants had to fill out questionnaires and took part in a trust game as well as in a coin flip setting. In step two they were informed about the outcome of one of these decisions and paid afterwards.

Step One. Participants were surveyed during an introductory psychology class. Our experiment manipulated one factor between-subjects (conditional vs. unconditional feedback) and one factor within-subjects (trust game vs. coin flip). To the beginning of the psychology class we asked students to participate in an experiment by filling out a questionnaire. Then two different kinds of questionnaires – one for the conditional feedback condition and one for the unconditional feedback condition – were randomly assigned to them.

Conditinal feedback. First, students were asked for a personal codeword to ensure anonymity in the questionnaire. Then, they were told that they would have to make three decisions from which one would be randomly chosen to be carried out for real money. In a next step, the binary trust game was introduced to them and they had to fill in 4 control questions regarding the outcomes of this setting. Participants should estimate which percentage of trustees would

behave trustfully and share the €20 equally vs. the percentage of trustees that would prove untrustworthy and keep the whole €20 for themselves. Hereafter, participants learned that they should make a decision in the role of the trustor as well as in the role of the trustee.

In the role of the trustor participants had to decide whether they want to keep €5 or hand it over to the trustee. They were informed that trustors would learn the decision of the trustee as well as being paid during the next class, if they handed over the money. However, it was emphasized that if they kept the €5, they would receive this money in the next class too, but would never learn the decision of their assigned trustee.

Furthermore, participants had to decide what they would do, if they received €20 in the role of the trustee. As described, they could decide to keep this whole amount for themselves or to give back €10 to the trustor. Students were told that participants that were randomly selected as trustees would be informed about the decision of their assigned trustor as well as paid being in the next class. Then participants made their decision both as trustee and trustor.

Hereafter, the coin flip was introduced to participants. A situation was presented in which a person received €5 and could bet this money on heads or tails in a coin flip. In the case that the person bet the money and won, the person received €10. However, if the person bet the money and lost, the person lost the €5. To ensure the understanding of that paradigm, participants had to fill in 3 control questions regarding the outcome of this setting. Then participants were told that they should now make a decision for the coin flip that would be conducted during the next class one week later. Therefore, they should indicate whether they want to keep or to bet €5 in the described coin flip. Only if participants decided to bet the money, they should indicate whether they want to put their money on heads or tails. It was stressed that the coin flip, which would be conducted

one week later, was only of importance for participants that decided to bet their money.

At the end of the questionnaire, participants had to fill out some questions concerning demographical data.

Unconditinal feedback. Questionnaires in the unconditional feedback condition were almost identical to the ones in the conditional feedback condition. Only the conditions of feedback differed that participants received in both decisions, when they kept the €5.

In the trust game, participants were informed that they would always learn the decision of their assigned trustee, if they decided in the role of the trustor and this decision would be selected to be carried out with real money. Before participants made their decision it was emphasized that they would also learn the decision of their assigned trustor when keeping the €5. This was different to the conditional feedback condition in which trustors only learned the decision of their assigned trustee, if they handed over their money.

In the coin flip, participants should not only chose heads or tails, if they bet the €5 but also when they kept it. When they kept the money, they were asked to indicate whether they would have put their money on heads or tails, if they had bet it. It was emphasized that we would remind them in the next week on their decision for heads or tails. Thus, participants knew that they would be aware of whether they would have won or lost their €5 during the next class, if they decided to keep their money.

Step two. In the beginning of the introductory psychology class, one week after participants had filled out the questionnaires, a coin was flipped in the front of the classroom. At the end of the lecture all participants received an envelope that was only marked with the personal codeword participants had provided one week before. For each participant the envelope contained the information which of his three decisions was selected to become real as well as the money that

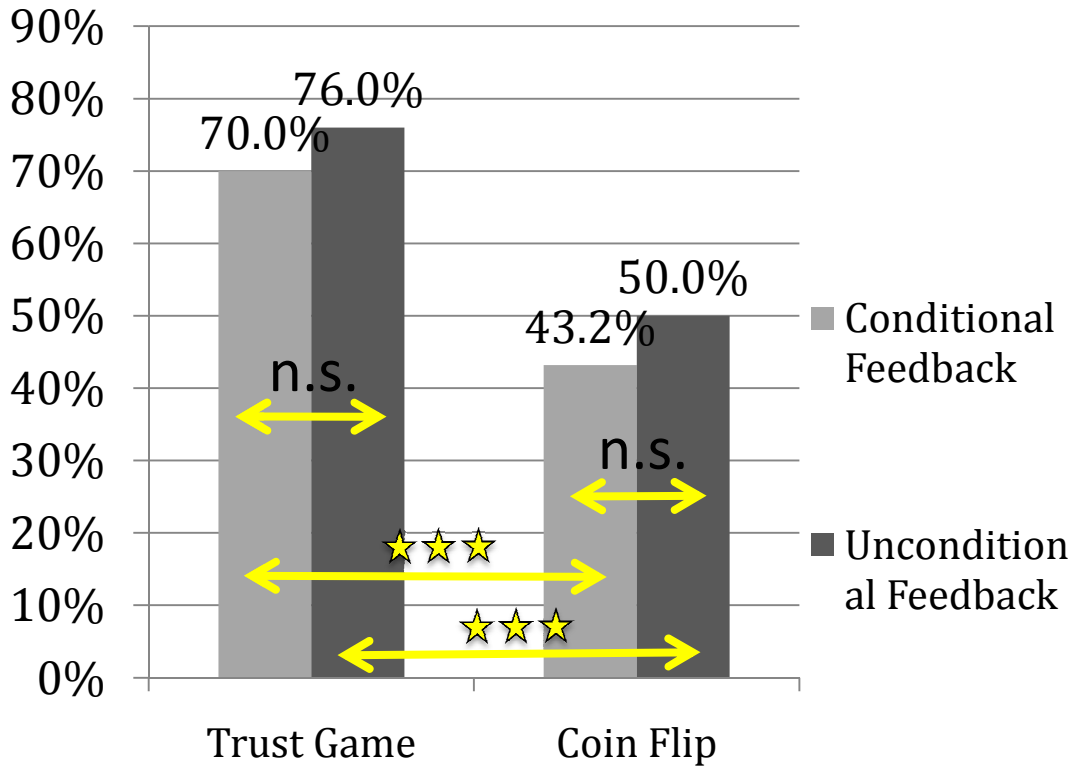
was related to that decision. Furthermore, all participants that were assigned to the unconditional feedback condition, but had decided to keep the €5 were informed, if they would have doubled the money by handing it over in the trust game or betting it in the coin flip respectively.

6.3. Results

6.3.1. The influence of curiosity and regret on trust decisions

The main question of this paper was whether trust decisions are influenced by curiosity or regret aversion. In order to find out, we compared a trust game with conditional feedback to a trust game with unconditional feedback. In the first one trustors had to hand over money to learn the decision of their interaction partner and in the second one they received this feedback independently of their decision to hand over or keep their money. We expected to find more trustors handing over money in the conditional feedback than in the unconditional one, if they were mainly influenced by curiosity. However, we argued that also the reverse result could emerge, if trustors were more regret averse than curious in the conditional feedback condition. Figure 6 shows that 70% of the trustors handed over money in the conditional feedback condition and 76% in the unconditional one. Although this result suggested that participants were influenced rather by regret aversion than by curiosity a subsequent chi-square test showed that the difference in risky decisions between both feedback conditions was far from being significant, χ^2 (1, n = 165) = .45, *n.s.*

Figure 6: Percentage of participants, who chose the risky option in the trust game and the ordinary coin flip, separated by condition



*Note: *p < .1; **p < .05; ***p < .01*

6.3.2. Replication of Past Findings

A secondary purpose of this study was to replicate past findings regarding trust behavior and regret aversion.

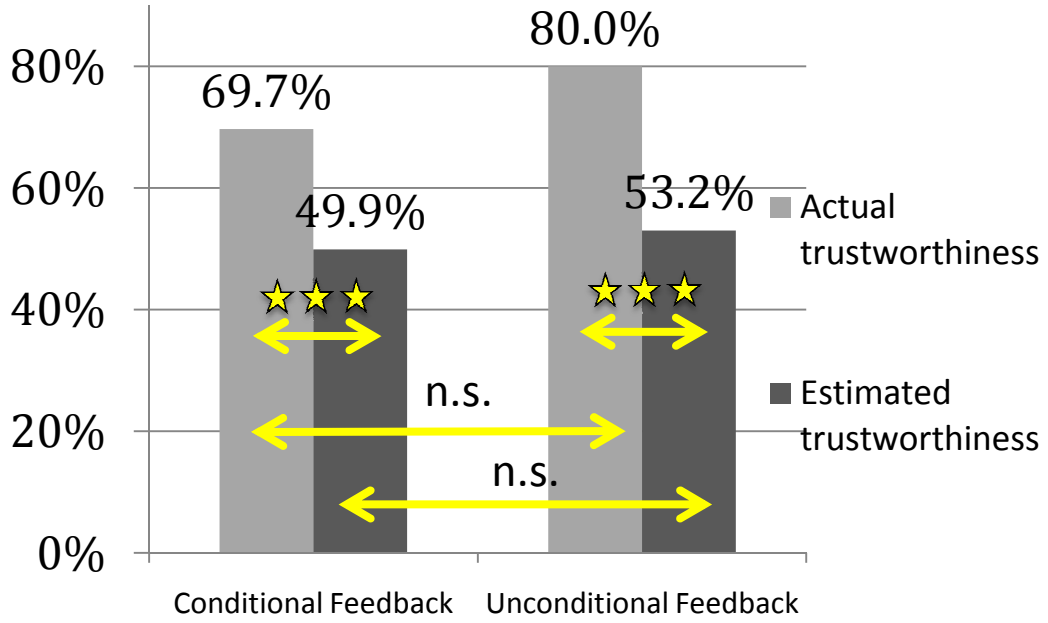
Trust vs. risk behavior. First, we wanted to find out whether we can replicate the finding that people are less risk seeking in trust situations than in risky situations void of trust. Therefore, we had to compare the trust game with the coin flip in the conditional feedback condition. However, before we could compare the coin flip to the trust game we had to ensure that the perceived risk in both paradigms was similar. The objective chance to double the money in the coin flip was 50%. The estimated percentage of trustworthy trustees in the conditional feedback condition that can be interpreted as the perceived chance of doubling the money in the trust game was 49.9% (*SD* = 26.3%) on average. An one sample t-test showed that the

objective chance of winning in the coin flip and the perceived chance of winning in the trust game were not significantly different, $t(88) = -0.05$, *n.s.* Thus, we could compare the trust game with the coin flip.

However, although participants perceived both settings as equally risky, only 43.2% bet their money on the coin flip but almost 70% (30 percentage points more) of the participants were willing to hand over money in the trust game (see Figure 6). A McNemar test revealed that this difference was significant, $p < .01$. We could also replicate the finding that people are much too cynical about the trustworthiness of others. In line with past studies most of the participants (69.7%) indicated in the role of the trustee that they would share received money with the trustor equally. However, as showed above, in the role of the trustor they were too cynical and estimated that only 49.9% ($SD = 26.3$) of their peers would do so. A one sample t-test revealed that this difference between actual trustworthiness of 69.7% and estimated trustworthiness of 49.9% was significant, $t(88) = -7.12$, $p < .01$ (see also Figure 7).

Although not predicted, we found similar results in the unconditional feedback condition. Again the trust game was comparable to the coin flip in matters of the perceived risk involved in both settings. Trustors estimated on average that 53.2% of trustees would prove trustworthy. This is not significantly different to the chance of doubling the money in the coin flip (50%), $t(74) = 1.14$, *n.s.* Again a McNemar test revealed that with 76%, much more participants handed over money in the trust game than participants bet money on the coin flip, in which only 50% were willing to go for the risky option, $p < .01$ (see Figure 7).

Figure 7: Trustor's estimations of trustworthiness of trustees in the trust game in comparison to the actual behavior of trustees, separated by condition



*Note: *p < .1; **p < .05; ***p < .01*

Furthermore, participants underestimated the trustworthiness of others in the unconditional feedback condition, too. Actually, 80% of participants decided to be trustworthy in the role of the trustee, however, at the same time they estimated that only 53.2% (*SD* = 24.5) of their peers would do so in the same position. A one sample t-test showed that this difference was significant, $t(74) = -9.47$, $p < .01$ (see also Figure 7).

Regret aversion in risky decisions void of trust. The coin flip was also introduced to replicate the influence of regret aversion on risky decisions void of trust. In the conditional feedback condition, participants could avoid potential regret by keeping the money. Thus, we assumed to find fewer participants betting money on the coin flip in the conditional feedback condition than in the unconditional one. In fact, 50% of participants bet their money on the coin flip under unconditional feedback, whereas 43.2% of participants did so under conditional feedback. However, like in the trust game, this difference was not significant, χ^2 (1, n = 177) = .4, *n.s.*

6.4. Discussion

The main purpose of this study was to examine the influence of curiosity as well as regret on trust decisions. We argued that trustors could hand over money in trust games because they might be curious about the behavior of their interaction partner. In addition, we pointed out that people, who trust others out of curiosity, also run the risk to get betrayed and, thus, to regret their decision to trust afterwards. We argued that this tendency could have an opposing influence on trust decisions to curiosity, because people tend to avoid potential regret. On that issue, we compared a trust game with conditional feedback to one with unconditional feedback. Higher trust rates under conditional than unconditional feedback would have supported the curiosity hypothesis while reverse result would have supported the regret hypothesis. However, we could not find a statistically significant difference in trust rates between both conditions. Under conditional feedback 70% of the participants handed over their money to a trustee. Under unconditional feedback, the share of trusting participants rose to 76%. This finding does not allow us to draw a clear conclusion about the influence of curiosity and regret aversion on trust decisions. In fact, this finding allows different and equally reasonable interpretations.

First, it is possible that neither curiosity nor regret aversion has an influence on trust decisions. In terms of curiosity it is just as possible that people are not interested in the behavior of their interaction partner as it is possible that they are. Likely, people participating in trust games do not understand that they take part in a pure trust situation that is different to the kind of trust situations they face in everyday life. A second possibility is that people recognize the uniqueness of the trust situation they are confronted with, but do not consider this new situation as interesting or exciting enough to become curious – although this is hard to believe for a psychological scientist.

Harder to explain would be why regret aversion does not have an influence on trust situations. As we have shown above, regret aversion is a frequently replicated phenomenon in risky situations void of trust. However, it could be that people have inherently different motivations in trust than in lottery situations and, thus, avoiding regret has only little or no influence on people in trust situations. This logic would match the finding by Fetchenhauer and Dunning (2010b) that people's behavior in trust situations is also quite insensitive to changes in risk as pointed out in the introduction.

Second, it is possible that we did not find a difference in trust rates between the conditional and the unconditional feedback condition, because trustors were influence by curiosity and regret aversion to the same extend. Curiosity could have increased trustors' propensity to hand over money in the conditional feedback condition while regret aversion would have diminished it. Potentially, both forces could have balanced. The finding that curiosity can kill regret in risky situations void of trust was already reported by Van Dijk & Zeelenberg (2005).

On the basis of our data we cannot determine which explanation is more valid. Also a consideration of the results of the coin flip cannot shed light on that issue. In fact, taking the results of the coin flip into account brings up a third possible explanation for the null results of this study. Unexpectedly, we could not replicate an effect of regret aversion in the coin flip. Similar to the trust game, the number of risky choices in the coin flip was higher under unconditional feedback (50%) than under conditional feedback (46%) whereas this difference was not significant. However, an influence of regret aversion on risky situations void of trust is a phenomenon frequently shown in past studies (Josephs et al., 1992; Zeelenberg et al. 1996; Zeelenberg & Beattie, 1997). Therefore, it might be that the design of this study itself failed to elicit regret aversion.

Participants in most former studies could chose between a more or a less risky lottery while it was manipulated about which lottery participants received unconditional vs. conditional feedback (Zeelenberg et al., 1996; Zeelenberg & Beattie, 1997). In contrast to these former studies, participants in our study did not choose between a more vs. less risky option but between a risky option vs. a sure one. Furthermore, our study did not reverse unconditional and conditional feedback between conditions. In fact, our study only manipulated whether participants received conditional vs. unconditional feedback about the risky outcome whereas they always received unconditional feedback about the sure outcome. It is possible that people, who are influenced by potential regret, when they have to decide between more or less risky lotteries, are not influenced by potential regret when they can decide between a sure gain and a lottery. These people might always prefer a sure option, if given to them.

Furthermore, it is possible in our case that regret aversion motivated these people even in the unconditional feedback condition to go for the sure option. Participants could not avoid potential regret here. They either ran the risk to learn that they could have doubled their money, if they kept it and their interaction partner was trustworthy, or risked to learn that they should have kept the €5, if they bet it and lost the money. Ordinarily, “losses loom larger than gains” (Kahneman and Tversky, 1979, p.279) for people (see also Kahneman, Knetsch, & Thaler, 1991). That means it should feel worse to lose €5 than it is pleasing to win this money. In our trust game, as well as our coin flip, participants were told that they receive €5 that they can keep or hand over/bet to have the opportunity to receive additionally €5. Participants might have perceived the situation in which they hand over/bet money and lose it as a loss and the situation in which they keep money and learn that they could have doubled their money as a foregone gain. If that is true, participants should have perceived the first situation as more

regrettable than the second one and, thus, should have kept their money because of regret aversion not only in the conditional but also in the unconditional feedback condition.

This last potential explanation for our null results seems to be as reasonable as the first two explanations. However, it has to be borne in mind that the explanation discussed above is strongly based on the fact that we did not find an influence of regret aversion in the coin flip. Yet, the null-result in the coin flip could also have a further reason. The decisions of the trust game and coin flip were collected within-subjects. All participants were firstly confronted with the trust game and its related decisions and then with the coin flip. We did not alternate the order of the trust game and coin flip in order to get most valid and clean results for trustors' behavior between both (between-subjects) feedback conditions. However, this design may have caused flawed results in the coin flip because of an order effect. It is possible that the decisions in the coin flip were somehow influenced by the decisions in the trust game participants had had to make beforehand. Corroborating this reasoning, we found much higher rates of risky decisions (46%) under conditional feedback in the coin flip than in Chapter 4 and Chapter 5 as well as found by Schlösser (2009).

In conclusion, this study could replicate that people behave more risk seeking in trust situations than in risky situations void of trust, although they underestimate the trustworthiness of their partner of interaction by a crucial amount. However, the main question of this study, if trust decisions are influenced by curiosity and regret aversion, could not be answered. Therefore, further studies have to manipulate curiosity and regret aversion independently. Only if both potential motivations can be separated, we can finally determine the influence of curiosity on trust and maybe even explain why people behave so trustfully. Furthermore, this study showed that regret aversion could not be replicated in a risky decision situation slightly different to former situations that

were used to show regret aversion. We pointed out that this finding could be due to the within-subjects design we applied in this study. However, it is also possible that the phenomenon of regret aversion is not as reliable and fundamental as past studies want to make us believe. Thus, further research should also focus on the applicability and borders of regret theory explaining decision making under risk.

7. General discussion

7.1. Summary of empirical results and integrative discussion

All three studies I have discussed in this work examined explanations for trust behavior in an experimental setting.

In Chapter 4, I discussed common explanations for people exhibiting high trust posited by other researchers and tested them in a series of experimental studies. In this series of studies, my coauthors and I tested whether trust can be explained when we relaxed these strict assumptions made about human behavior and applied following economic and rational choice theory. Nonetheless, we only tested whether trust behavior can be explained by changing certain assumptions such theorists make about human behavior. We did not challenge the consequential approach in the theories.

In addition, we tested whether high trust rates in past studies were caused by a methodological flaw, the fact that participants made their decisions using a show-up fee. Our results showed that high trust rates cannot be explained by house money effects or beliefs about trustworthiness, risk tolerance, or distributional preferences.

In Chapter 5, we examined trust situations in which trustors cannot improve their circumstances by trusting. To the best of my knowledge, this was the first time these kinds of trust situations were examined empirically. In order to do that, we systematically manipulated the potential gains trustors could acquire in trust games if they relied on a trustworthy trustee (betweens-subjects). This examination also tackled the question concerning the extent to which trust behavior of people is influenced by strategic considerations. Furthermore, we compared the behavior of the trustors to the behavior of people who participated in lotteries that were void of trust but involved similar risks and identical gains like those considered in the trust games. Our results showed two things. On the one hand,

trustors were strongly influenced by changes in potential gains in both the trust games and the lotteries. They exhibited lower trust when the potential gains were smaller. On the other hand, risky decisions in the lottery decreased to almost zero when no more gains could be made, while the trust rates in the trust games were quite stable even when there were no or negative potential gains.

When the results reported in Chapters 4 and 5 are considered jointly, it is easy to see that the economic or rational choice approach to trust fails to explain that phenomenon. Even if the assumptions of these concepts are relaxed, trust behavior cannot be explained. The experiments covered in the two chapters also challenge the perspective that trust decisions are instrumental or consequential, which means only focused on outcomes.

The experiments covered in Chapter 4 produced no evidence that trustors care about the outcomes for the trustee when they make trust decisions. There was only scant evidence that trustors cared about their own outcomes in the trust game. A much higher percentage of participants in the trust game chose the risky option than participants in the coin flip, although both situations involved comparable risks as well as potential gains and losses. Furthermore, participants' beliefs about their chance of doubling their money in the trust game (estimated percentage of trustworthy trustees) had very little influence on their decisions to trust.

The results of the study in Chapter 5 strongly underline that trust cannot be merely outcome-focused. Although participants in a trust situation reacted quite strongly to changes in their potential gains, a substantial percentage of them trusted when we explicitly stated that they could not be better off and might be worse off by trusting. Again, I want to stress here that participants in the experiments described in both chapters had to make all their decisions using their own money. To the best of my knowledge, we are the first ones who conducted trust games in which participants

had to use their own money. Thus, the studies applied a much more realistic and conservative test of outcome-based trust explanations than all former studies.

To summarize, while we found evidence that trust is partly determined by instrumental or consequential considerations, we also showed that these considerations were rather weak and cannot be the main drivers of trust behavior.

The question remains concerning which motivations or dynamics drive trust, if not considerations about outcomes. In Chapter 6, my coauthors and I approached that issue and examined whether trustors are influenced by curiosity in the moment they make their decision. In addition, we explored the influence of regret aversion on trust decisions.

The empirical results reported in Chapter 6 replicated the findings concerning high trust rates that were reported in Chapters 4 and 5. In addition, we substantiated our findings that more people accept risks in trust situations than in situations void of trust. However, I could not answer the main question posed by this study: whether people participating in the trust game are influenced by curiosity or regret aversion.

7.2. Conclusion

In the introduction to this work, I posed a question concerning whether a change in thinking is necessary to explain the phenomenon of trust. Thereby, I challenged the validity of the strict economic and rational choice perspective as well as all consequential accounts of trust. In line with previous studies, I showed that trust behavior cannot be explained by a strict economic or rational choice approach. In addition, I showed that trust behavior is also not explainable when the strict assumptions of economic or rational choice theory are relaxed. These results corroborate the idea

presented by Dunning and Fetchenhauer (2010) that trust is basically non-consequential.

However, the results of this work also show that there are limitations on the conclusion that trust is basically not outcome-driven. First, I have probably not tested all possible outcome-based explanations for trust behavior. Second, I revealed that trust behavior is partly based on consequential or outcome-focused considerations since I could find an influence of potential gains and a weak influence of risk on trust decisions.

Thus, this work first and foremost indicates that trust is a much more complex phenomenon than often assumed in the past. A change in thinking is insofar necessary that scholars examining trust have to adopt an interdisciplinary perspective. However, this work also revealed that past research put too much weight on the importance of consequential considerations in trust decisions. Further research should, therefore, focus more on non-consequential accounts - the next section provides an overview.

8. Non-consequential accounts of trust

In contrast to researchers who accept neoclassical economic theory or rational choice sociology, those in other scientific disciplines do not assume that trust is driven by considerations about outcomes. A very comprehensive view of human decision making and behavior is provided by psychological scientists. These scholars have claimed that human decision making and social behavior are influenced by two different systems (Kahneman, 2003; Loewenstein, Weber, Hsee, and Welch (2001); Stanovich & West, 2000; Strack & Deutsch, 2004). In the literature, one can find various names attached to both systems. However, scholars who describe dual-system models bear similar ideas, so, following Stanovich and West (2000), I will refer to these systems with the generic names System 1 and System 2. System 1 is characterized as intuitive, fast, and effortless while System 2 is slow, controlled, rule-based, and effortful. In everyday language, System 1 can be described as people's intuition and System 2 as people's reasoning (Kahneman, 2003).

Applying the framework of dual-system models to the topic of this work, most of the research on trust has considered trust decisions to be a result of rational considerations taking place in System 2. Apart from Chapter 6, in which my coauthors and I considered non-strategic, emotional curiosity as a reason for handing over money in trust games, the explanations of trust behavior examined in this work also assumed trust to be a behavior based on rational considerations. In contrast to these consequential accounts, researchers have already started to consider risk behavior to be strongly influenced by emotions, which are part of System 1.

Of particular interest is a paper by Loewenstein et al. (2001) in which "the central role that feelings play in determining people's choice and other responses under conditions of risk and uncertainty" is underlined (p. 274). Loewenstein et al. differentiated between

anticipatory emotions (here immediate emotions) and anticipated emotions. Immediate emotions are those people feel in the moment they make their decision and should be ascribed to System 1 rather than System 2. Anticipated emotions are those people predict they will feel in the future when they learn the consequences of their decisions. These emotions are the result of more deliberate considerations and should be ascribed to System 2 rather than System 1. Loewenstein et al. assumed that particularly immediate emotions, "which are often quite independent of the consequences of the decision can play a critical role in the choice one eventually makes" (p. 281).

In the realm of trust, this hypothesis was corroborated by Schlösser et al. (2010). They showed that immediate emotions rather than expectations about future gains influence the decision to trust. In this study, participants were asked to indicate their emotions regarding six different scenarios just before they made their decision as a trustor in a trust game. Two of the scenarios asked for immediate emotions, and the other four scenarios asked for anticipated emotions. Measuring immediate emotions, participants were asked to indicate just before making their actual decision how they would feel if they 1. kept their money or 2. handed it over. To measure anticipated emotions, participants were asked to indicate how they would feel in the future if they 1. kept their money, and their interaction partner proved trustworthy; 2. kept their money, and their interaction partner proved untrustworthy; 3. handed over their money, and their interaction partner proved trustworthy; and 4. handed over their money, and their interaction partner proved untrustworthy. From a consequential perspective, only anticipated emotions -if any- should have predicted the decisions of the participants because they focus on the outcome of a decision. However, anticipated emotions accounted for only an insignificant 10% of the decisions to trust. In contrast, immediate emotions had a

significant impact in predicting the decision to trust or distrust, accounting for 21% of the variance in the decisions.

In summary, considering the influence of emotions on trust behavior seems very promising with respect to explaining high trust rates. However, until now, it has been unclear why immediate emotions influence people in trust situations to such a great extent. Furthermore, the study by Schlösser et al. (2010) also clearly revealed that immediate emotions cannot be the only factor that determines trust behavior. In this work, we showed that the outcomes of a trust decision under certain conditions influenced trust behavior. Thus, the interplay of emotions and rational considerations should be subjected to further research.

Dunning and Fetchenhauer (2010) used the results of Schlösser et al. (2010) to promote the idea that trust is an expressive rather than an instrumental act. This means that people trust "because of direct rewards the behavior itself provides or because performing the act itself fulfills some goal" (p. 102). In the same paper they discussed the possibility that trust behavior is based on a norm. Also in the work on hand it was examined whether trust behavior in trust games is based on norms of distributive justice. However, the norms considered here were outcome-oriented, meaning they examined whether trustors hand over money based on a norm that demands that trustors to accomplish certain outcomes. In contrast, Dunning and Fetchenhauer (2010) suggested that trustors may follow a norm that arises from the fact that trustors are placed in a relationship with the trustee that makes trustors behave "nicely" towards the trustee without focusing on outcomes. Fetchenhauer and Dunning (2010c) supported this idea in a study in which they showed that a minimal relationship between trustor and trustee is needed to trigger high trust rates. They conducted a binary trust game under three different conditions. Under the first condition, trustors were told that they had been assigned to a specific trustee before they

made their decision. Under the second condition, they were told that they had not yet been assigned to a specific trustee. Under the third condition, trustors were informed that they had been assigned to a trustee who did not know about the trust game and would never be informed about it if the trustor kept his money.

Trust rates of 55% and 60% were found under the first and the third conditions. This is an indication that as soon as a minimal relationship was established between trustor and trustee, there were high trust rates, even when this minimal relationship was restricted to private knowledge held by the trustor. However, only about 35% of trustors decided to trust under the second condition in which no minimal relationship was given.

These results are quite impressive, but the influence of norms on trust behavior needs to be corroborated in further studies. Trust behavior might be caused by factors different from norms. Moreover, I know from my own research that people are not able to tell whether they trusted based on a norm, a finding that was also reported by Dunning and Fetchenhauer (2010) as well as Zak (2008).

9. Further research

The research discussed in the last section indicates the necessity for trust research focusing on emotions and norms. In the next few paragraphs, I will briefly delineate other areas for further research. Subsequently, I will present some study suggestions that apply or combine ideas and methods from the research fields discussed.

9.1. Trust and individual differences

The role of individual differences on the propensity to trust has not been thoroughly examined experimentally (Evans & Revelle, 2008; Snijders & Keren, 2001). The relationship of individual differences and self-reported trust towards a stranger has been examined by researchers using instruments like the World Value Survey. Their most common findings are that trust is positively associated with optimism, age, education and Protestantism (e.g., Delhey & Newton, 2005; Herreros & Criado, 2008; Uslaner, 2002). However, as I already stated in the introduction, such self-reports can be biased. Furthermore, in Chapters 4, 5, and 6, I showed that trust on the cognitive side does not have to be related to trust behavior. In Chapter 10, I will point out particular individual differences that could influence trust behavior. Moreover, I will examine possible interactions between individual differences and situational factors. However, research should not stop here but should consider further individual differences that can contribute to explaining trust.

9.2. Intercultural trust research

A further area for future research is intercultural trust research based on behavioral trust data. This research can shed light on how strongly trust behavior is influenced by cultural norms. In addition, a comparison of cultures and their levels of expressed trust could yield insights into how and why certain trust norms develop. Henrich et al.

(2010) did such an analysis on fairness norms with the help of a standardized dictator, ultimatum and third-party punishment game (see also Gächter, Herrmann & Thöni, 2010). Variations on the trust and investment game have been conducted in a multitude of cultures (Ashraf et al., 2006; Croson & Buchan, 1999; Holm & Danielson, 2005). However, these trust and investment games differed greatly in their experimental design. In a recent meta-study considering trust and investment games conducted all over the world, Johnson and Mislin (2008) showed that about 40% of the variance between the trust rates in these games can be explained by the differences in the experimental protocols. Thus, in the future, a standardized trust game should be used to measure trust behavior in a broad range of cultures.

9.3. Trust and evolutionary psychology

Trust behavior could be based on a cognitive adaptation evolved in humans' environment of evolutionary adaptiveness (EEA). This cognitive adaptation could have evolved to solve the fitness relevant problem to deal with or establish cooperation with strangers in the EEA. Findings of Fetchenhauer and Dunning (2009, 2010a) as well as those reported in this work show that people trust from a behavioral side but distrust from the cognitive one. From an evolutionary perspective, the behavior and cognition people express in trust situations involving strangers makes sense.

For anyone who wants to establish cooperation, trust behavior is necessary because it is just not possible to begin cooperation with distrust. As shown in the TIT-FOR-TAT strategy, people have to begin with trusting as a first step when they are interested in future cooperation (Au & Komorita, 2002; Axelrod & Hamilton, 1981).

In addition, high suspicion of trustors can be explained by the evolutionary approach. Accordingly, even if it were an advantage to establish cooperation with strangers in the EAA in order to survive, by the same token, it cannot be adaptive to trust under every

condition. Such humans would be easy prey for all kinds of exploitation. Therefore, a cognitive adaptation that influences people to trust should take costs of trusting into account as well as a cautious assessment of potential interaction partners.

The finding that people seem to be influenced by immediate emotions in their decision to trust (Schlösser et al., 2010) also fits in this framework. Cognitive adaptations influence behavior through emotions (Cosmides & Tooby, 1992, 2000).

One might argue that a cognitive mechanism evolved for the EEA, cannot account for trust behavior in trust games because interactions with strangers in the natural past of humans were neither certain one-shot interactions nor entirely anonymous. However, some researchers have argued that precisely because their cognitive machinery is not evolved for economic games, people behave in these paradigms as if their interactions were not anonymous or nonrecurring (Hagen & Hammerstein, 2006; Price, 2008). The argument is that people are either not adapted to anonymous one-shot interactions at all or that people are adapted to these situations but that economic games do not resemble these ancestral situations, so they trigger the wrong cognitive module to behave appropriately in these games. The last argument is based on the fact that people who take part in an economic game usually gather with many other participants in one room and know that their behavior will be analyzed by the experimenter (Price, 2008). Thus, although participants might know that their interactions in economic games are anonymous and nonrecurring, it could be that cognitive mechanisms are triggered that have evolved for situations in which behavior was neither anonymous nor nonrecurring.

However, the evolutionary approach presented is highly speculative. To corroborate the idea that findings in the trust game can be explained by a cognitive adaptation, one must meet difficult requirements. Adaptations have to solve problems relevant to fitness,

which cannot be solved by other adaptations, in situations that recurred ancestrally and are marked by reliable, repeated structures and identifiable cues (Cosmides & Tooby, 2000). Whether a cognitive adaptation that is trust-related satisfies these requirements has not been examined yet.

9.4. Trust, biology and neuroeconomics

Up to this point, I have considered trust from a psychological, economic, sociological, and philosophical point of view. However, in recent years, more and more researchers from various disciplines have examined biological foundations of social behavior (Camerer, Loewenstein, & Prelec, 2004; Epstein, Israel, Chew, Zhong, & Knafo, 2010; Fehr & Camerer, 2007). They are searching for genetic influences on human behavior and trying to get a deeper understanding of how brain processes and hormones are related to social behavior. There are multitudes of methods used in this research, including twin studies, genome-wide association studies, functional magnetic resonance imaging, and manipulation of hormones.

Concerning trust it was shown that trust behavior is strongly influenced by the neuropeptide oxytocin. In a study by Kosfeld, Heinrichs, Zak, Fischbacher, and Fehr (2005), participants who received an intranasal administration of oxytocin sent more money to a stranger in a trust game than participants who were administered a placebo. However, oxytocin did not affect participants' estimates about being repaid by the trustee nor their risk tolerance in a lottery void of trust.

Others have shown that trust is partly inheritable. Cesarini, Dawes, Fowler, Johannesson, Lichtenstein, and Wallace (2008) examined the trust behavior of monozygotic (genetically identical) and dizygotic (genetically nonidentical) twins in Sweden and in the United States. By comparing dizygotic and monozygotic twins, they were able to separate environmental influences on trust from genetic ones.

They estimated that trust was 20% inherited in the Swedish sample and 10% in the U.S. sample.

In summary, biology could help to disentangle to what degree trust is hardwired and independent of situational factors. This analysis may also explain individual differences in trustfulness by examining genetic differences. Moreover, the methods of neuroeconomics might illuminate how trust decisions are processed in the brain and whether the brain processes trust decisions differently to risky decisions void of trust.

10. Further studies

10.1. More nosy than regret averse – Five follow-up studies

In Chapter 6, my coauthors and I emphasized the need for further research on the influence of curiosity and regret aversion on trust decisions. We discussed the possibility that neither curiosity nor regret aversion have an influence on the decision to trust. However, we also pointed out that the design of the experiment I presented might have been inappropriate to show the influence of curiosity and regret aversion.

In that study, the trust rates of a trust game with conditional feedback were compared to those in a trust game with unconditional feedback. In the trust game with conditional feedback, trustors learned whether their trustee was trustworthy only if they handed over money to him. In the trust game with unconditional feedback, trustors always learned whether their trustee was reliable no matter if they decided to hand over money to the trustee or to keep it.

We argued that neither curiosity nor regret aversion should have influenced trustors in the trust game with unconditional feedback to shift their decision from keeping the money to handing over the money or vice versa. Under this condition, trustors always learned whether their trustee was trustworthy, so they should not have been influenced by curiosity. In addition, they could not avoid regret. If they kept the money, they ran the risk of learning that their trustee would have been trustworthy and that they could have doubled the money by handing it over. However, handing over the money could not protect them from potential regret. If they handed over the money, they ran the risk of learning that their trustee was untrustworthy and that they would have been better off keeping their money.

In contrast, in the trust game with conditional feedback, a trustor should have been influenced by both regret aversion and curiosity, but in opposite directions. On the one hand, trustors learned about the trustworthiness of their trustee only if they handed over money. Hence, curiosity should have influenced the trustors to hand over their money. On the other hand, under conditional feedback, trustors could avoid potential regret by keeping their money. If trustors kept their money, they never learned the reliability of their trustee, so they never knew whether they would have doubled their money by handing it over. Hence, regret aversion should have influenced trustors to keep their money.

In summary, the methodological weakness of the experiment presented was that an influence of curiosity and regret aversion on the trust decision was not present under unconditional feedback, but both were present simultaneously in the conditional feedback condition. The presented experiment could only have shown an influence of curiosity or regret aversion if one of these forces had been much stronger than the other one. If that had been the case, a comparison of the trust rates under both conditions would have revealed the stronger force. A strong influence of curiosity combined with a weak (or absent) influence of regret aversion would have led to higher trust rates under the conditional than the unconditional feedback condition. A strong influence of regret aversion combined with a weak (or absent) influence of curiosity would have led to lower trust rates under the conditional than under the unconditional feedback condition. In the experiment, comparably high rates of trust were found. Hence, trustors were influenced neither by curiosity nor by regret aversion, or they were influenced by both forces to a similar extent. A third possibility is that the design of the study in Chapter 6 was not appropriate to measure curiosity or regret aversion in the trust game.

In the following chapters, I describe 5 studies extending the research on curiosity and risk aversion. Studies 1 and 2 show different methods to measure the influence of curiosity and regret aversion in trust games. Studies 3, 4, and 5 show how the design of the experiment from Chapter 6 could be altered so that the presence of curiosity and regret aversion can be manipulated independently.

10.1.1. Curious people trust while regret averse people distrust? Examination of individual differences

All studies on trust towards strangers show that some people trust strangers and some do not. Hence, these studies reveal individual differences in the level of trust. The following study considers whether these individual differences in expressed trust at least partly stem from individual differences in curiosity and regret aversion. Do curious people trust and regret averse people distrust?

If that is true, the null results in Chapter 6 would be explainable. In the conditional feedback condition, trustors would have been influenced by curiosity as well as regret aversion. The individual differences in curiosity and regret aversion would have caused the trustors who were more curious than regret averse to trust in the conditional feedback situation. Trustors who were more regret averse than curious kept their money in this condition. In contrast, under unconditional feedback, trustors would have neither been influenced by curiosity to hand over their money nor by regret aversion to keep their money. Thus, more curious as well as more risk averse trustors could have made decisions quite randomly in the unconditional feedback situation. If in addition it is assumed, that about 50% of our participants were more curious than regret averse and the other 50% were more regret averse than curious, trust rates of about 50% should have been observed under both feedback conditions. Under conditional feedback, the 50% of participants who trusted would have been rather curious participants, and the 50% who distrusted would have been rather regret-averse participants.

The same distribution of decisions in the unconditional feedback condition would have been due to random behavior. Random behavior also results in a 50/50 distribution of choices.

To test the validity of this reasoning, the individual level of curiosity and regret aversion of participants that attend a trust game should be measured beforehand.

Concerning curiosity, it is known that people differ in their level of curiosity (see Loewenstein, 1994 for an overview). The literature provides various measurements of curiosity. For the following 4 studies, I use the Curiosity and Exploration Inventory (CEI) developed by Kashdan, Rose, and Fincham (2004). This 10-item inventory provides good validity and temporal consistency.

Unfortunately, there is no measure for individual differences in regret aversion. However, Josephs et al. (1992) showed that people differ in their tendency to make regret-minimizing choices. They argued that the person's chronic level of self-esteem determines whether he is regret averse or not. Accordingly, people with low self-esteem are regret averse because they want to protect themselves from threat. In three studies, Josephs et al. supported this theory empirically. Using the method they developed, I will measure the self-esteem of participants using the 10-item Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965) as a proxy.

In all studies in which curiosity or self esteem are used to predict trust behavior, participants should fill out the CEI and the RSES at least two weeks before they make their trust decision in the lab. This should ensure that participants are not influenced by the questionnaires in their decision to trust.

10.1.2. Study 1

The first study examines whether the level of individual curiosity and the individual level of self-esteem can predict decisions in trust games. In order to do this, the experiment presented in

Chapter 6 is replicated. However, a difference in this experiment is that the curiosity and self-esteem of participants who attend the trust game as trustors is surveyed two weeks before they make their decisions in the lab. Furthermore, only the trust game under *conditional* vs. *unconditional feedback* (between-subjects) is examined and not the lottery paradigm.

I expect that the feedback condition alone cannot predict trust behavior in this experiment. However, I expect an interaction between the feedback condition and curiosity as well as the feedback condition and self-esteem on the decision to trust. The higher a trustor's curiosity, the more likely it should be that he or she would hand over money in the conditional feedback situation. In addition, the higher a trustor's self-esteem, the more likely it should be that a trustor would hand over money in the trust game in the conditional feedback situation. In addition, it should be analyzed whether a three-way interaction of curiosity, self-esteem, and a feedback condition can be found.

10.1.3. Study 2

Study 2 is a pilot study that should yield insight into the question concerning the strength of curiosity or regret aversion in trust decisions. The question that should be answered is whether people pay to receive or avoid feedback about the decision of their interaction partner and whether this willingness to pay is related to individual differences in curiosity and self-esteem.

In order to do this, a trust games is conducted under two conditions: *default feedback* and *default no feedback*. Participants are randomly assigned to one of the two conditions and should make a decision as a trustor.

In the *default no feedback condition*, participants are told that they can keep or hand over money. In addition, they are informed that they have two possibilities to receive feedback about their

interaction partners. They can either hand over their money or they can keep their money and pay for the feedback information. If they decide to keep their money and pay for the information, they should indicate how much of their show-up fee (€5) they are willing to pay. To elicit the true willingness to pay, an auction that is based on the Becker–DeGroot–Marschak (BDM) mechanism (Becker, DeGroot, & Marschak, 1964) is used. This means that participants are informed that the experimenter will randomly draw a price between €0 and €5 after the experiment. If their indicated willingness to pay is higher than the randomly drawn price, they will pay only the drawn price and receive feedback about the decision of their interaction partner. However, if their indicated willingness to pay is lower than the randomly drawn price, they will not have to pay anything but also will not receive feedback.

Under the *default feedback condition*, participants should indicate whether they want to keep or hand over money, too. They are told that they will receive feedback about their partner of interaction no matter whether they will keep or hand over their money. However, they are offered to turn down receiving feedback if they keep their money. If they decide to keep their money and turn down feedback, they have to pay for that. Then, they should indicate how much of their show-up fee (€5) they are willing to pay in order to avert feedback. To elicit their true willingness to pay, the same BDM-auction is used as in the conditional feedback condition.

After the experiment, it is analyzed whether trustors in the *default no feedback condition* who chose to keep their money paid for feedback about their interaction partner. If a willingness to pay is found, I expect this willingness to pay to be dependent on the level of curiosity the participants indicated in the CEI – more curious participants should have a higher willingness to pay.

In the *default feedback condition*, it is analyzed whether trustors who chose to keep their money paid for avoiding feedback. If

a willingness to pay is found, I expect this willingness to pay to be dependent on the self-esteem of the participants. Following Josephs et al. (1992), participants with a lower self-esteem should have a higher willingness to pay.

Unfortunately, this experiment has three shortcomings.

1) The willingness to pay for receiving feedback cannot be compared to the willingness to pay for avoiding feedback. The reason is that curious participants who want to receive feedback in the *default no feedback condition* do not necessarily have to pay for the feedback but can just hand over their money to their trustee.

2) Only the behavior of participants who keep their money can be analyzed and compared. However, it would also be interesting to know about their willingness to pay for receiving feedback from the trustors who hand over their money.

3) The experiment does not manipulate the presence of curiosity and regret aversion independently. It suffers from the same weakness as the experiment that was presented in Chapter 6. That means that a trustor who keeps his money under the *default no feedback condition* but is curious can choose the feedback information. However, if he does, he also has to accept the risk to learn that his interaction partner was trustworthy and the possible regret that he did not hand over his money. The same logic holds true for trustors who keep money in the *default feedback condition* and want to protect themselves from regrettable feedback. They can pay to avoid this information but this will mean never satisfying their curiosity. Admittedly, the experiment partly handles this problem by measuring individual differences. However, it is not clear yet whether these individual differences can explain the decision-making in trust games.

Avoiding all three shortcomings of Study 2, Studies 3, 4, and 5 manipulate the influence of curiosity and regret aversion independently.

10.1.4. Study 3

Study 3 provides a possibility to analyze the curiosity of trustors about the decision of their interaction partner in the absence of potential regret. Furthermore, it provides a possibility to measure the willingness to pay for feedback on the decision of the interaction partner of trustors who keep their money as well as trustors who hand over their money. The design of Study 3 entails deception.

In Study 3 participants are invited to a lab and seated in a cubicle with a computer. All participants are told that they will have to make two monetary decisions during the experiment in which they can make real money. Furthermore, all participants are told that some of them will make both decisions for real money and some just one. Since in the beginning of the experiment they neither know whether they will make both decisions or only one decision for real money nor which decision will be made for real money in the latter case, they should take both decisions seriously. Then the trust game with conditional feedback is introduced to the participants and they make a decision as the trustor. They are informed that they will learn the decision of their trustee at the end of the experiment if they hand over their €5 and are selected to make this decision or both of their decisions for real money.

Hereafter, participants are instructed that they will now participate in a lottery. In the lottery, participants do not have to bet money but can win €10 (this is the same amount of money they could win in the trust game) or nothing. In the lottery, participants have to choose between two doors. Participants are told that behind one of the doors is the €10 and behind the other one there is nothing. Actually, it does not matter which door participants choose; they will always win the €10. Hereafter, the software assigns the participants randomly to one of two conditions: the *one-win* or *double-win condition*.

Under the *one-win condition*, participants are told that they made only the second decision for real money and that they will, thus, receive €10. They are informed that they have been assigned to a real trustee who also made a decision in the trust game and that this trustee was paid according to his decision and the decision of the participant. Whether they kept or handed over their money, participants are told that they are not supposed to learn the decision of their trustee (no matter whether they kept or handed over their money) because they did not make their trust decision for real money. However, participants are offered the chance to receive feedback about the decision of their trustee although they themselves did not make the first decision for real money. Participants should indicate a price between €0 and €5 they would pay for this information. The true willingness to pay is elicited by using a BDM auction as proposed in Study 2.

Under the *double-win condition*, participants are told that they made both decisions for real money and that therefore they will receive €10 plus the amount they made in the trust game. They are informed that they have been assigned to a real trustee who also made a decision in the trust game and that this trustee was paid according to his decision and the decision of the participant. Participants who handed over their money receive feedback about the decision of their trustee. In addition, participants who kept their money in the trust game are offered the chance to receive feedback about the decision of their trustee although they kept their money. Again, they can pay for this information, and their true willingness to pay is elicited as it was in Study 2.

After the experiment, all participants receive their money. In addition, a random price between €0 and €5 is drawn. Participants who took part in the *double-win condition* and kept their money as well as all participants of the *one-win condition* receive feedback only

if the price they were willing to pay for this information is higher than the randomly drawn price.

In this experiment, participants who take part in the *one-win condition* have the opportunity to receive feedback about their interaction partner and satisfy their curiosity without the risk of experiencing regret. In the moment they make their decision, they do not know that this decision will not be carried out for real money. Afterwards, they should not feel any regret about the consequences of their trust decision because they know that the decision had no impact on their payoffs. However, they should still be curious about the decision of their interaction partner, when they can decide to receive or avoid feedback. They learn that their interaction partner made a real decision and was paid according to his or her own decision and the decision of the participant. Thus, the reality of the situation is not diminished by the fact that the trustor did not decide for real money. The feedback information about the trustee is real and can be known by the trustor. As mentioned in Chapter 6, people get particularly curious about information that is "already out there in the world" and can be known (Loewenstein, 1994; Van Dijk & Zeelenberg, 2005).

In contrast, participants who take part in the *double-win condition* and keep their money should stay regret averse after they made their decision in the lottery. If they receive feedback about their interaction partner, they run the risk of learning that their interaction partner was trustworthy and that they would have doubled their money by handing it over.

After the experiment, first data of the *one-win condition* is analyzed, to find out whether trustors who decided to hand over their money indicated a higher willingness to pay for interaction partner feedback than trustors who decided to keep their money. Such a result would support the hypothesis that more curious participants are more likely to hand over money in trust games with conditional

feedback. However, it is also possible that no difference in the willingness to pay will be found. That could be true if, in general, trustors who hand over money and trustors who keep money are equally curious about the decision of their interaction partner. The difference in their decision to keep or to hand over money would then have to be attributed to a difference in regret aversion of both groups. Trustors who kept money would have been as curious as trustors who handed over money but more averse to regret.

To investigate this question, the willingness to pay for feedback of trustors who kept money in the *one-win condition* is compared to that of trustors who kept money in the *double-win condition*. Again, regret aversion cannot have an influence on the trustors' willingness to pay in the *one-win condition* but it can influence trustors in the *double-win condition*. Thus, if trustors who kept money in the *double-win condition* display a significantly lower willingness to pay for interaction partner feedback than trustors in the *one-win condition*, an influence of regret aversion on decisions in trust games with conditional feedback could be corroborated.

It should be emphasized that the test of an influence of regret aversion is a very conservative test because trustors who keep money in the *double-win condition* receive a total of €15 in the experiment. In contrast, trustors who keep money in the *one-win condition* receive only €10. Thus, possible income effects should influence trustors in the *double-win condition* to pay more for interaction partner feedback than trustors in the *one-win condition*.

A potential weakness of Study 3 is that the presence of curiosity as well as regret aversion is measured by the willingness to pay for interaction partner feedback. However, the question that should be answered is whether curiosity and regret aversion influence the decision to trust.

10.1.5. Study 4

Study 4 explores whether the presence or absence of potential regret, while deciding in a trust game, can influence the decision. In Study 4 participants attend a trust game with conditional feedback in which they make a decision as a trustor. Participants are randomly assigned to one of two conditions (between-subjects). The first condition is the *regret condition* and the second one is the *no regret condition*. Participants in both conditions are informed that only half of them will make their decision for real money and that it has already been randomly determined who will make his or her decision for real money. However, it is manipulated which information participants receive at what time. Participants in each condition are informed about the particular procedure of their condition before they make their decision:

Under the *regret condition*, all trustors will first learn whether they made their decision for real money at the end of the experiment. Subsequently, all trustors who handed over money are informed about the trustworthiness of their trustee. Then participants are paid, and the experiment is over.

Under the *no regret condition*, first, all trustors who handed over money are informed about the decision of their trustee at the end of the experiment. Subsequently, only trustors who kept money as well as trustors who handed over their money and were assigned to a reliable trustee learn whether they made their decision for real money or not. Then, participants are paid, and the experiment is over.

The situation of the *regret condition* does only differ from the situation of an ordinary trust game with conditional feedback in that only half of the participants will make their decision for real money. As in the ordinary trust game with conditional feedback, trustors can satisfy their curiosity about their interaction partner only by handing over money. However, if they hand over money, they run the risk of

learning that their trustee was unreliable and that they would not have lost their show-up fee by keeping the money.

In contrast, under the *no regret condition*, participants cannot be influenced by regret. If they keep their money, they will never learn the decision of their interaction partner and will never know whether it would have been better to hand over the money. If they hand over their money, they learn the decision of their interaction partner. However, in contrast to the *regret condition*, in the *no-regret condition* this information is not potentially threatening. If they learn that their trustee was reliable, they know that they made a good decision. If they learn that their trustee was untrustworthy, they will never learn whether they made their decision for real money. Hence, they can easily rationalize that their decision was probably not made for real money anyway.

After the experiment, it is analyzed whether more trustors handed over money under the *no-regret condition* than in the *regret condition*. This result would support the hypothesis that trust decisions are influenced by curiosity in the ordinary trust game with conditional feedback.

10.1.6. Study 5

In Studies 3 and 4, the influence of regret aversion is examined only indirectly. Both studies, examine whether the influence of curiosity becomes stronger if the experimental design eliminates the presence of regret aversion. Furthermore, in the first four studies, regret aversion was considered to be a factor that promotes risk-averse behavior (keeping money) only. However, past studies showed that regret aversion can also promote risk-seeking behavior (Zeelenberg et al., 1996; Zeelenberg & Beattie, 1997). Study 5 is designed to examine whether regret aversion can also promote risk-seeking behavior (handing over money) in trust situations.

The design of Study 5 is similar to that of Study 4. Again, participants attend a trust game playing the role of the trustor and are randomly assigned to two conditions that are identical to the *regret* and *no-regret condition* of Study 4. The only difference to Study 4 is that this time the trust game features unconditional feedback instead of conditional feedback, which should cause trustors to be in a very different decision situation.

Now, the situation of the *former regret condition* (here: *condition 1*) does only differ to the situation of a trust game with unconditional feedback with respect to the fact, that only half of the participants will make their decisions for real money. In contrast to Study 4, the decisions of participants playing under this condition should be influenced neither by curiosity nor by regret. All trustors are informed whether they made their decision for real money and, independent of their own decision, all trustors learn the decision of their interaction partner.

Also the *former no-regret condition* (here: *condition 2*) changes entirely. In contrast to Study 4, trustors can no longer be influenced by curiosity, but they may be influenced by the threat of future regret. They cannot be influenced by curiosity because they receive feedback about the decision of their interaction partner independently from their own decision. However, trustors can be influenced by regret now. Trustors first learn whether their trustee was reliable or not. Then all trustors who kept their money as well as those who handed over money and were assigned to a reliable trustee are informed whether they made their decision for real money. This means that trustors who keep money run the risk of learning that their trustee was reliable and that they made their decision for real money. Thus, keeping the money can cause regret in the future. The only thing trustors can do to avoid potential regret in the future is to hand over their money. If they hand over their money and learn that their interaction partner was trustworthy, they know that they made a

good decision. If they hand over their money and learn that their interaction partner was untrustworthy, they will never know whether they made their decision for real money.

After the experiment, it is analyzed whether more trustors handed over money under *condition 2* than *condition 1*. This result would support the hypothesis that trust decisions are influenced by regret aversion in the ordinary trust game with conditional feedback.

A potential weakness of Study 4, and in particular Study 5, is there complexity. Thus, it is very important in both studies that the procedure of the experiments is thoroughly explained to all participants. In order to make sure that participants know the potential consequences of their behavior, they should be confronted with all scenarios that might happen when they keep or hand over their money, respectively.

However, if an influence of the manipulations of Studies 3, 4, and 5 can be found, a next step should be to examine in each experiment whether the effect of the manipulation on the trust decision is mediated by emotions that are related to curiosity or the fear of future regret.

10.2. Normative influences on trust

10.2.1. What we can learn from a public trust game

To investigate the relationship of trust and norms, I suggest as a first step a study that increases a normative influence on the decision of trustors in a trust game. This study should explore whether the behavior of trustors changes when the influence of norms is increased. Furthermore, this study can explore in which direction the behavior changes and thus might provide an idea about what kind of norms are prevalent in trust situations related to strangers.

To increase the potential influence of norms in a trust situation related to a stranger, I suggest comparing an anonymous trust game

to a public one. In a public trust game, trustors could make their decision sitting with other trustors in one room and their decisions, identified with their first names, could be written on a board at the end of the experiment. Trustors in the public trust game would still be anonymous to the trustee but not to other trustors or the experimenter.

Researchers have shown in other experimental games like the dictator game that participants adjust their behavior according to social norms when their decision is not entirely confidential. In a dictator game, the dictator can distribute a certain amount of money between himself and a second anonymous person (receiver). Usually, a double-blind design is applied in these games, which means that neither the receiver nor the experimenter can match the identity of a dictator to his decision. Hoffman, McCabe, Shachat, and Smith (1994) revealed the change from a double-blind design to a single-blind design, in which the experimenter knew the decision of the dictator and had a strong, positive impact on the amount the dictator gave to the second person (see also Hoffman, McCabe, & Smith, 1996). Furthermore, it was shown that even the display of stylized eye-like shapes on a computer screen while dictators decide how much money to allocate to a second person can significantly increase their generosity (Haley & Fessler, 2005).

In summary, participants who attend dictator games and play the role of dictators behave in a more pro-social manner when their decisions can be observed by others or when they feel observed. This behavioral change makes sense because it is assumed that participants who attend a dictator game know that the social norm in this game is to behave unselfishly and share a substantial proportion of the given money with the receiver (Androeni & Bernheim, 2009).

From this analysis, one can conclude that participants playing a public trust game as trustors become concerned about social norms and the right behavior in this situation as well. However, in

contrast to the dictator game, it is not clear what kind of norm prevails during the trust game because trust is a double-edged sword.

On the one hand, without trust, many social dilemmas could not be solved (Kollock, 1998; Rothstein, 2000). In the introduction, I described the positive effects of trust on the individual, organizational, and societal level. Thus, trusting strangers can be seen as ethically right and admirable. Trust in the trust game could be seen as particularly heroic because the trust is pure here and can easily be exploited by the trustee. Thus, trusting in this situation might be considered to be a very strong signal of pro-social and reputational behavior.

On the other hand, the opposite could be true. Precisely because trustees can exploit credulous trustors, trusting in the trust game could be seen as foolish and naïve.

The comparison of an anonymous trust game and a public one could shed light on the question of how most of the trustors assess this situation. It would make sense to add a coin flip to this experiment (between-subjects) to make sure that a difference in trust behavior between the anonymous and the public condition is not based on changed risk attitudes.

10.2.2. The influence of descriptive and injunctive norms on trust decisions

Even without knowledge of the particular norm that may be active in a trust situation involving strangers, social influence is known to affect people's behavior in two different ways (Deutsch & Gerard, 1955). First, people can be influenced by descriptive norms, which specify what is usually done in a certain situation. People follow descriptive norms because they encompass information regarding behavior that is deemed effective or adoptive in a particular situation (Cialdini, Reno, & Kallgren, 1990; Reno, Cialdini, & Kallgren, 1993). Second, people can be influenced by injunctive norms, which

specify the behaviors that are usually approved in a certain situation. People follow these norms in order to avoid social sanctions (Cialdini et al., 1990; Reno et al., 1993).

The question arises as to whether or not people are influenced by descriptive or injunctive norms when making trust decisions. Furthermore, an examination of descriptive norms may explain the way in which trust is maintained in complex societies. A susceptibility to following a descriptive norm of trust may be one mechanism of maintaining high trust environments. An examination of injunctive norms may clarify whether people trust strangers because they believe that doing so is the morally right and socially expected behavior. This question is of particular interest in combination with other social dynamics that may encourage trust behavior, such as status or reputation, as explained in Chapter 10.4.

Study 1. In order to examine the influence of descriptive and injunctive norms on trust, as a first step, I suggest measuring perceived descriptive and injunctive norms in a trust game and examining whether or not people behave in accordance with these perceived norms. In order to do so, participants would attend a trust game as trustors. Before making their decision, they would be asked to estimate the percentage of other trustors who would hand over money, as opposed to those who would keep the money in this particular decision situation, as a means of measuring the perceived descriptive norm. In order to measure the perceived injunctive norm, trustors should be asked to estimate the percentage of trustors who would say that someone should hand over the money, rather than keeping it, in this particular decision situation.

After the experiment, two things should be explored. First, the average perceived descriptive and injunctive norm in the trust game should be considered. Second, whether people behave in accordance with their perceived descriptive or injunctive norm should be analyzed. In addition, if influences of the perceived norms can be

determined, it should also be investigated whether people are more strongly influenced by the perceived descriptive or the perceived injunctive norm.

As the experiment is explorative, I do not have particular predictions as to the particular norms trustors perceive in a trust game nor as to whether or not they act in accordance with these perceived norms.

Study 2. I suggest proceeding one step further in a second experiment, in which participants attend a binary trust game under different norm manipulations (between-subjects). The descriptive norms could be manipulated by informing the participants that most people usually trust others in the trust game or that they tend to distrust others in the trust game. Injunctive norms could be manipulated by providing the participants with information as to whether or not others approve of handing over money in the trust game. However, in order to make the norm information credible and avoid arousing suspicion among participants, the norm manipulation should be done in a rather subtle manner.

In order to meet these requirements, participants could be invited to a lab to take part in a decision situation. Upon the participants' arrival at the lab, they could be informed that they would need to wait briefly, as other participants are still completing the last session in the lab. Participants would be asked not to speak with one another prior to the experiment and to be ready to enter the lab immediately so as to avoid delays for later groups. In actuality, the participants in the lab would be comprised of two pairs of confederates, who would discuss the decision situation upon leaving the lab. The confederates' statements could be manipulated according to the norm manipulation in a full between-subjects design. The confederates should leave the lab in pairs of two. To manipulate the descriptive norm, one pair of confederates could discuss the fact that the vast majority of people handed over money in this decision

situation or that the vast majority kept the money in the decision situation or an unrelated topic. In order to manipulate injunctive norms, the second pair could relate to the fact that most people thought that handing over money in the trust game was the right thing to do or that most believed that the only appropriate action to take in this situation was to keep money in the trust game or an unrelated topic. The experiment would feature a 3 (descriptive norm = handing over money vs. descriptive norm = keeping money vs. control) x 3 (injunctive norm = handing over money vs. injunctive norm = keeping money vs. control) between-subjects design. In order to make it plausible that the faux participants possess information about the decision situation, prior to the experiment, the real participants should be informed that they will be able to ask questions regarding the decision situation after the experiment. Furthermore, after the experiment, participants should be assessed in a funnel interview in order to determine whether they suspected the norm manipulations.

As the experiment is explorative, I do not have particular predictions regarding main or interaction effects of descriptive and injunctive norms.

If an influence of norms on trust behavior is determined, it would be interesting to understand how norms influence trust behavior. Emotions have been argued to play a key role in compliance with social norms (Fehr & Fischbacher, 2004). Thus, further studies should examine whether a change in behavior under certain norm manipulations is caused by a change in emotions that trustors experience while they are making their trust decision.

10.3. The flesh is willing, but the spirit is weak?

Kugler et al. (2009) demonstrated that trust rates dramatically decrease if trustors are instructed to consider the consequences of their decision to trust or distrust. In an experiment a continuous trust game was applied, in which trustors were endowed with 20 $1

bills and told that they could give between $1 and $20 to the trustee. The experimenter handed the trustee three times the amount of money that the trustor gave the trustee, who could send any fraction of it back to the trustor. Kugler et al. found that trust rates decreased if participants were told they should estimate before they made their actual decision how much their trustee would give them back when they sent either $1 or $10 or $20 to the trustee.

The results of the study conducted by Kugler et al. (2009) are particularly interesting in view of the fact that trust decisions seem to be influenced by emotions as well as rational considerations, as indicated at the beginning of Chapter 8. I have argued that emotions are rooted in an automatic, effortless, and implicit system (System 1), whereas rational considerations are rooted in a controlled, rule-based, and effortful system (System 2). I also already pointed out that scientists have only just begun to understand the ways in which the interplay of emotions and rational considerations influences trust decisions.

Kugler et al. (2009) argued that the change in behavior in their study was caused by the fact that trustors were asked to consider the consequences of their behavior. However, it is also possible that not only consequential thinking diminishes trust, but also the mere use of System 2. It is the distinct feature of System 2 to operate rational, rule-based. The risky nature of trust situations may become obvious when people thoroughly think about trust situations. In the trust game, individuals may additionally become more aware of the fact that the trustee has no rational reason to reciprocate their trust. Thus, the use of System 2 or the mere act of thoroughly thinking about a trust situation involving an unknown person resp. may inevitably lead to consequential thinking and lower trust. This logic also accords with the findings that I have presented in this work. Namely that on the cognitive side, people tend to distrust others and underestimate their trustworthiness, while trusting on the behavioral

side. Thus, it seems plausible that an antagonistic relationship exists between emotions and rational considerations or between System 1 and System 2, respectively in relation to trust. It appears as though emotions tend to influence people to trust, and rational considerations tend to influence people to distrust.

Although it seems plausible that System 2 might influence people to distrust others, the question as to why emotions influence people to trust remains. At this point in time, I can only speculate about the reasons for that; nonetheless, I can offer two suggestions. First, Dunning and Fetchenhauer (2010) suggested that "favorable feelings might become more attached to trust and unfavorable feelings attached to the decision not to trust" and that "people may develop somatic markers, visceral or physiological reactions, that lead them to act in a more pro-social way than their risk tolerance and social expectations" (p. 122). A second explanation for the antagonistic relationship between emotions and rational considerations is the evolutionary account of trust presented in Chapter 9.3.

However, evidence also exists, indicating that neither consequential thinking nor a higher involvement of System 2 negatively influences trust behavior. On the one hand, this work, as well as that of Fetchenhauer and Dunning (2009), found high rates of trust in binary trust games, in spite of trustors being asked to estimate the percentage of trustworthy trustees. On the other hand, Schlösser et al. (2010) conducted a binary trust game in which trustors were to indicate their immediate and anticipated emotions. As described in Chapter 8 of this work, when trustors have to indicate their anticipated emotions, they are confronted with all of the possible consequences that their decision to keep or to hand over money might have. Nevertheless, Schlösser et al. (2010) still found high trust rates.

How can these contradictory findings be explained? I believe that these contradictory findings might have been caused by differences in design between the studies.

In the study conducted by Kugler et al. (2009), participants were asked to estimate the trustworthiness of trustees after they had been made aware of the fact that they would take on the role of the trustor and immediately before they made their decision. In contrast, in the study conducted by Fetchenhauer & Dunning (2009), as well as in all of the other studies presented here, the participants were first asked to estimate the trustworthiness of trustees and were only subsequently told that they would take part in the trust situation as the trustor. Hereafter, they were again confronted with their decision options and were thus unable to make their decision until then. Therefore, in these binary trust games, participants may no longer have been influenced by their (consequential) estimates by the time they were finally supposed to make their decisions.

Second, in the study conducted by Kugler et al. (2009), a continuous trust game was used. A continuous trust game is far more complex than a binary one. Not only do trustors have to decide whether to hand over money or to keep it, they must also determine the amount of money that they wish to hand over. Furthermore, they must estimate whether their trustee is trustworthy, as well as the extent of this person's trustworthiness. Thus, a continuous trust game provides a considerably greater number of opportunities for strategic considerations. Consequently, System 2 should be far more active in a continuous than in a binary trust game, thereby inducing trustors to be more influenced by consequential considerations in a continuous trust game.

With respect to the study by Schlösser et al. (2010), it is possible that asking trustors for their anticipated emotions may induce less of an activation of System 2 and less consequential thoughts than one might think at first glance. When trustors are

asked to indicate their anticipated emotions, they do not actively ponder what will possibly happen upon handing over or keeping money, and are instead merely confronted with the emotional outcomes.

Summarizing the last paragraphs, it is not entirely clear whether consequential thinking or a strong activation of System 2 diminishes trust, nor whether an antagonistic relation exists between System 1 and System 2 concerning trust. In order to find out, I suggest three experiments. In all of the experiments, it should be examined whether not only consequential thinking, but also the mere manipulation of the involvement of System 2 or rational considerations respectively influences trust.

In a first study, the results obtained by Kugler et al. (2009) should be replicated. In addition, Study 1 should examine whether a manipulation of System 2 by a cognitive load manipulation or the instruction to think thoroughly about the trust decision can influence trust behavior. In a second study it should determine whether the manipulations utilized in Study 1 can also influence trust decisions in a binary trust game. In the third study, the influence of System 2 should be manipulated with a self-control depletion task. In addition, Study 3 should examine whether people trust less when their System 2 is more active due to the fact that they are more strongly influenced by rational considerations. At the end of this section, I will explain how these findings might be used to yield a deeper understanding of the ways in which the interplay of emotions and rational considerations influences trust decisions.

Study 1. In a first study, I suggest expanding the first experiment conducted by Kugler et al. (2009) with two additional conditions (between-subjects). As described above, in experiment 1 of Kugler et al. trustors were to determine the amount of money to give a trustee in a continuous trust game. Under the consequential thinking condition, they were asked to estimate the amount of money

that their trustee would return to them, if they were to give them either $1 or $10 or $20, prior to making their actual decision. Under *the control condition*, they were simply asked to make their decision without being told to estimate what the trustee would return to them. To the two conditions of the study conducted by Kugler et al. (2009), a third (*high cognitive influence condition*) and a fourth (*low cognitive influence condition*) could be added. Under the *high cognitive influence condition*, the influence of System 2 would be enhanced by instructing the participants to thoroughly consider their decision prior to making it. Under the *low cognitive influence condition*, the influence of System 2 would be weakened by a cognitive load task. Past studies indicated that cognitive load diminishes the influence of System 2 while enhancing the influence of System 1 (Greene, Morelli, Loewenberg, Nystrom, & Cohen, 2008).

The experiment should be replicated in a computer lab, in which participants would fill out all of the questions on a computer. All of the participants could be informed that they are taking part in an experiment examining the relationship between reaction time and decision making. Subsequently, participants would first be confronted with the continuous trust game paradigm, in which the trustor would be referred to as Person 1 and the trustee as Person 2. Hereafter, in order to measure reaction time, streams of digits would appear on the computer screen, and participants would be asked to press the space bar each time they came across the digit “5” within this stream. This reaction-time measure would actually be a cognitive load manipulation taken from a study conducted by Gilbert, Tafarodi, and Malone (1993). Subsequently, the computer would randomly assign the participants to one of four conditions.

Under the *consequential thinking condition*, participants would be instructed to no longer pay attention to the digit stream. They would then be informed that they would now make a decision as Person 1 in the previously described situation and that they should

estimate the amount of money that Person 2 was likely to return to them, if they gave him or her either $1 or $10 or $20.

Under the *high cognitive influence condition*, participants would be instructed to no longer pay attention to the digit stream. They would then be informed that they would now make a decision as Person 1 and that they should thoroughly think about their decision as to whether to keep or to hand over money. To ensure that participants follow this instruction, they would be informed that they would be required to wait at least 2 minutes before they would be able to indicate their choice on the computer.

Under the *low cognitive influence condition*, participants would be instructed to continue searching for a "5" in the stream of digits and that they should now make a decision, taking on the role of Person 1.

Under the *control condition*, participants would be instructed to no longer pay attention to the digit stream. They would then be informed that they would now make a decision in the previously described situation as Person 1.

I predict that the findings of Kugler et al. (2009) would be replicated. Furthermore, I expect that under the *consequential thinking condition* and under the *high cognitive influence condition*, on average, trustors would give the trustee similarly low amounts. In addition, I expect that, on average, trustors under the *low cognitive influence condition* would send the highest amounts of money to the trustee.

Study 2. If Study 1 demonstrated that not only consequential thinking but also the low cognitive influence condition and/or the high cognitive influence condition influence trust, I would attempt to replicate these findings in a binary trust game. Thus, Study 2 would be identical to Study 1, aside from two changes. First, participants would attend a binary trust game rather than a continuous one. Second, the *consequential thinking condition* would be eliminated.

I expect less trustors would hand over money under the *high cognitive load condition* than under the *control condition* and the *low cognitive influence condition*. Furthermore, I predict that the highest percentage of trustors would hand over money under the *low cognitive influence condition*.

Study 3. If Study 2 demonstrated that the results of the continuous trust game are transferable to the binary trust game, I would attempt another manipulation of the influence of System 2 in a third study. Furthermore, I would examine whether people trust less when their System 2 is more active due to the fact that they are more influenced by rational considerations.

Another possible means of manipulating the influence of System 2 is to manipulate people's self-control capacity. Self-control can be defined as "the exertion of control over the self by the self" (Muraven & Baumeister, 2000, p. 247). It is related to resisting temptations, coping with stress and negative emotions, aggressive and criminal behavior, among other things (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister & Heatherton, 1996; Muraven & Baumeister, 2000). Most interesting in relation to this study is the fact that self-control is required whenever people act in accordance with the rational considerations of System 2 that interfere with the impulsive motivations of System 1 (Hofmann, Friese, & Strack, 2009). Muraven and Baumeister assume that individuals possess different levels of self-control capacity. However, independent of basic levels of self-control capacity, a special feature of self-control is the fact that it is not an unlimited resource but is actually depleted when used (Baumeister et al., 1998). Consequently, when individuals must engage in an activity that requires self-control, they tend to have less self-control available for a subsequent task.

If rational considerations and emotions have an antagonistic influence on trust, people with depleted self-control should have less willpower to resist their emotions. If it is assumed that emotions

influence people to trust and that rational considerations influence people to distrust, people with diminished willpower should trust more in a binary trust game than those with willpower that has not been exhausted.

In order to test my hypothesis, I suggest conducting a binary trust game, in which participants play the role of trustors under a *depletion* and under a *no-depletion condition* (between-subjects). In order to manipulate self-control, I suggest a design similar to the one utilized by Baumeister et al. (1998) in a study on self-control. Furthermore, in order to examine the effect of self-control more extensively, I suggest collecting self-control traits of all of the participants that attend the experiment at least two weeks in advance. As a trait measurement of self-control, researchers could use the scale developed by Grasmick, Tittle, Bursik, and Arneklev (1993).

Participants could be invited to single sessions in the lab and could be told that they will attend two independent studies. They would be informed that one of the studies would examine perceptions about food and that they should, therefore, not eat anything for at least 3 hours prior to the experiment. Upon arriving at the lab, the participants would be given a questionnaire that would describe a binary trust game, in which the trustor would be referred to as Person 1 and the trustee as Person 2. Participants would then be asked to estimate the percentage of individuals taking on the role of Person 2 (trustees) that would share money in this paradigm (that is to say, that would share received money). Subsequently, the questionnaire would close, and the participants would be instructed to ask the experimenter for the next questionnaire. As soon as the participants indicated that they had finished the questionnaire, the experimenter would explain to the participants that the other room for the food perception task was now free and that they would first participate in the food task and would continue with the decision task later. Subsequently, they would be put into a room with two

bowls on the table, one containing tasty chocolate chip cookies and chocolate candies and the other containing fresh radishes. Participants in the *depletion condition* would be told that both radish and chocolate were highly distinct foods and that they would have been assigned to the radish condition. Then they would be asked to eat at least three radishes within the next 5 minutes but would be told not consume any chocolate chip cookies or chocolate candies. The experimenter would leave the room and observe by means of a one-way mirror whether the participants resist eating any of the forbidden food. Baumeister et al. (1998) found that resisting tasty food depletes the self-control capacity of hungry people. After 5 minutes, the experimenter would return and inform the participant that she or he would now need to wait 15 minutes for the sensory memory to fade, after which they would fill out a food perception questionnaire. Subsequently, participants would be asked to finish filling out the questionnaire for the first decision task during this break. After the trust game participants would be checked for suspicion in a funnel interview, paid and debriefed. The procedures in the *no depletion condition* would be identical to those of the *depletion condition*, except that participants would be asked to eat at least 3 pieces of chocolate chip cookies or chocolate candies.

I expect that more trustors would hand over money under the depletion than the *no-depletion condition*. Furthermore, I expect that participants with lower self-control would be more willing to hand over money in the trust game. In addition, I expect that the estimated reliability of trustees would be a stronger predictor of trust behavior in the *no-depletion* than in the *depletion condition*.

A manipulation of the involvement of System 2, as shown above, could also illuminate how the interplay of emotions and rational considerations influences trust decisions. There are different possibilities imaginable. First, it might be that a higher involvement of System 2 suppresses the influence of System 1 and by this the

influence of emotions. In other words, the emotions people have while deciding in a trust situation do not change but are overwritten by a strong influence of rational considerations. Second, it is also possible that a high involvement of System 2 does not diminish the influence of emotions on trust decisions but changes the emotions themselves. People's decisions would be still strongly influenced by emotions but by different ones than in situations with less influence of System 2. A third possibility is that emotions are neither suppressed nor changed by a higher involvement of System 2 but that people adjust their trust decision more often according to anticipated rather than immediate emotions when System 2 is more strongly activated.

To illuminate the interplay of Systems 1 and 2 regarding trust decisions, further studies are imaginable similar to the suggested study, but extended by a measure of immediate and anticipated emotions.

10.4. On the relationship of status and trust

In a recent study, Willer (2009) showed that status dynamics can solve the collective action problem. In particular, he revealed that high contributors to a public game earned higher status from group members as well as external observers because they were perceived as more motivated to help the group (generous and cooperative). Furthermore, Willer (2009) showed that participants who earned high status for their contributions to the group were in turn more group-motivated and contributed more to the group in future interactions.

It seems plausible that status dynamics can influence trust behavior in a similar way. Collective action problems are social dilemmas like trust situations that involve strangers. In both situations all involved actors are better off if everybody cooperates, but incentives to defect can prevent this cooperative behavior (Kollock, 1998). If status dynamics can make people contribute to a public good, maybe status dynamics can also make people trust strangers.

Considering status in the context of trust is also interesting because researchers have argued that high-status people are more trusting since they have more resources than low-status people and can afford more trust (Smith, 1997; Uslaner, 2002). Extending this argument, I argue that high-status people might also trust more because they are more used to trust. High-status people usually have more social interactions than low-status people. Managers, politicians, or religious leaders, for example, have to trust all their subordinates. Furthermore, high-status people might have better experiences when they trust others than low-status people because high-status people have more power (Homans, 1961). Thus, it is more dangerous to behave in an untrustworthy way with a high-status person than with a low-status person.

Status dynamics could positively influence trust behavior in three ways. First, it is possible that high-status people trust more than those with low status, so trust behavior is associated with higher status. Perhaps people display trust in order to imitate high-status people and achieve more status themselves. Second, trust could be seen as a costly signal for resources and thus for higher status. Third, trust behavior could be regarded as a pro-social, group-motivated behavior, and through this mechanism, people who trust gain higher status. To get further insight on this issue, I suggest several studies and provide details in the next section.

10.4.1. Do high-status people trust more than low-status people?

First, an interesting question is whether high-status people trust more than low-status people. This question has already been partly considered by Hong and Bohnet (2007). In their study, they examined whether distrust of high- and low-status people is caused by different motivations. They distinguished two reasons for distrust. The first was inequality aversion, which is the trustor's distaste for being worse off than the trustee when the trustee proves unreliable.

The second reason was betrayal aversion, which is the trustor's dislike of being betrayed by the trustee. They found similar rates of trust among those in the different status groups but showed that those of higher status distrust because they are betrayal-averse, and low-status persons distrust because they are inequality-averse.

To measure risk attitudes, inequality aversion, and betrayal aversion, Hong and Bohnet (2007) applied paradigms similar to those found in Chapters 4 and 5 of this work. However, instead of placing participants into these paradigms, they confronted participants in all paradigms with a certain outcome and a game with two risky outcomes, one of which was higher than the certain outcome and the other one lower. Participants were then asked what their minimum accepted probability of receiving the higher outcome in the risky game is to take part in this game. For example, the study involved a trust game. However, instead of asking the participants whether they wanted to trust or distrust in this game, researchers asked participants for their minimum accepted probability of being matched with a trustworthy person to take part in the trust game. As Fetchenhauer and Dunning (2010b) pointed out, such a design causes very different decisions than a design in which participants are placed into a trust situation and can only decide between trusting and distrusting. Therefore, it is possible that high- and low-status people demand similar high probabilities to be matched with a trustworthy participant when they are just asked for them. However, they might decide very differently when they have to choose between trust and distrust in an actual trust situation.

In order to find answers to this question, I suggest applying a binary trust game to examine the influence of status on the decision to trust. Apart from generalized status characteristics (see Ridway & Walker, 1995) like gender, race, age and education, the subjective social status of participants who attend this trust game could be measured. Subjective social status is "a person's belief about his

location in a status order" (Davis, 1956, p. 154). Subjective social status can be measured by a 10-rung ladder self-report scale. Participants are told that this ladder represents society and asked to indicate on which rung they see themselves (Cantril, 1965).

I would expect that people with higher generalized status characteristics and a higher self-rated social status would be more willing to trust than people with a lower status. However, it could be that higher-status people can afford more risk. Thus, it would make sense to add a coin flip with similar pay-offs like the binary trust game to this experiment (between-subjects). I would not expect an influence of status on the decision to bet money in a coin flip, and if there is any, I would expect it to be a very weak one.

10.4.2. Does trusting enhance status?

Second, it could be examined whether people use the display of trust to enhance their own status in a group. This can be true only if trustful people are regarded as having a higher status than distrustful people.

Thus, as a first step, it could be analyzed whether people attribute more status to trustful than to distrustful people. Participants could rate the status of people in vignettes who differ (between-subjects) in their trustfulness. According to Ridgeway and Erickson (2000), status could be operationalized by asking the participants how honorable, prestigious, and respected they perceive people in the vignettes to be.

In a second step, it could be investigated whether people who aspire to a higher status are more willing to trust in a binary trust game than people with a weak status aspiration. To measure status aspirations, the achievement aspiration scale developed by Cassidy and Lynn (1989) could be used. Again, the coin flip could be added to this experiment as a control for risk preferences. Furthermore, it would make sense to manipulate whether the trust game is

conducted under anonymity or in public to influence status incentives (see Chapter 10.2.1.). Therefore, I suggest a 2 (trust game vs. coin flip) x 2 (anonymous vs. public) x 2 (high status seekers vs. low status seekers) mixed-factorial design. The kind of game as well as whether the trust game would be conducted anonymously or in public would be between-subjects factors while all participants would need to fill out a questionnaire measuring their status aspirations (within-subjects). I would expect that those seeking a high status would hand over more money in the trust game than low status seekers. Furthermore, I would predict that this relationship is moderated by whether the trust game is conducted anonymously or in public. I would not expect an effect of status aspiration or the manipulation of anonymity on the risky decisions in the coin flip.

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