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The pernicious role of history in economic behavior

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"Don't bring in anything in the present that doesn't have a past."

Stella Adler

(1901-1992)

English Summary

This cumulative dissertation is entitled „The pernicious role of history in economic behavior". It contains two published papers and one submitted manuscript demonstrating the negative potential of history in a variety of economic behaviors. The central finding is that the inability to overlook a past wrong drives people into various self-serving behaviors such as biased recollection, interpretation and invocation of the past, compensation-seeking and even retaliation against the wrongdoer. In some cases, these behaviors are supported with self-serving views of what happened as well as a blind spot around the consequences. The result is often deeper rifts between parties and greater monetary or psychological costs for all involved.

The first paper presents the results of an online survey demonstrating the deleterious effects of a past, unpaid loan upon the personal relationship between borrower and lender. The paper also documents self-serving recollections of the lending episode and a variety of self-serving behaviors by both parties. The key finding is that borrowers of unpaid loans deny and even depreciate the negative impact of their delinquency upon their relationship with the lender.

The second paper reports results of two experiments demonstrating that a shared, asymmetric history between negotiating dyads where one party previously benefited at the expense of the other, increases the likelihood of costly impasses. This is because the party who received the shorter end of the stick insists on being compensated in the focal negotiation, which claim is rebuffed by the party who had been previously advantaged.

Lastly, the dissertation includes a submitted manuscript investigating how compliance with a third party is reshaped after a group of people collectively experienced distributive injustice. Here, under-compliance is a proxy of compensation-seeking and negative reciprocity. The key results are that compensation may be sought from a party unrelated to the unfair loss, and that this behavior is fueled by corrupted beliefs about how others will behave. Moreover, wronged persons are willing to further decrease compliance if doing so can inflict a financial harm upon their wrongdoer, despite the psychological cost of going below their beliefs about what others will do.

In summary, results of the four studies presented in this dissertation support the wisdom of the proverbial advice that one should "let bygones be bygones." It seems that lingering on the past impedes unification and reconstruction by giving fertile ground for compensation-seeking and the self-serving invocation and interpretation of the past.

German Summary

Der Titel der vorliegenden Dissertation lautet „Der schädliche Effekt von Vorerfahrungen auf ökonomisches Verhalten“. Die vorliegende Dissertation besteht aus zwei publizierten Fachartikeln und einem zur Begutachtung eingereichten Manuskript, welche den negativen Einfluss von Vorerfahrungen in einigen ökonomischen Verhaltensbereichen aufzeigen.

Das zentrale Ergebnis lautet, dass das Unvermögen über ein in der Vergangenheit eingetretenes Ereignis hinwegzusehen, Personen zu verschiedenen Formen von eigennützigem Verhalten führt. Diese Verhaltensweisen umfassen eine systematisch fehlerbehaftete (*biased*) Erinnerung und Interpretation der Vergangenheit, eine Bemühung um Kompensation und sogar Vergeltungsmaßnahmen gegen Übeltäter. In einigen Fällen werden diese Verhaltensweisen durch Schutzbehauptungen gerechtfertigt. Daraus resultieren Risse zwischen Parteien und größere monetäre sowie psychologische Kosten für alle involvierten Personen.

Die erste Publikation präsentiert Ergebnisse einer Onlinebefragung, welche die negativen Effekte von vergangenen, unbezahlten Krediten auf die persönliche Beziehung zwischen Schuldner und Kreditgeber aufzeigt. Dabei konnte bei beiden Parteien eine eigennützige Erinnerung an die Leihfrist beobachtet werden. Das zentrale Ergebnis der Studie lautet, dass Schuldner von unbezahlten Krediten den negativen Einfluss ihres Vergehens auf die persönliche Beziehung zu ihren Kreditgebern bestreiten.

Die zweite Publikation berichtet Ergebnisse zu zwei Experimenten, welche aufzeigen, dass geteilte, asymmetrische Vorerfahrung zwischen zwei verhandelnden Parteien die Wahrscheinlichkeit von teuren Sackgassen erhöht. Die Asymmetrie der Vorerfahrung ist dadurch gekennzeichnet, dass eine Partei vor der eigentlichen Verhandlungssituation auf Kosten der anderen Partei finanziell profitiert. Dem Ergebnis liegt zugrunde, dass die ursprünglich benachteiligte Partei darauf beharrt, in der folgenden Verhandlungssituation kompensiert zu werden. Allerdings wird diese Forderung von der bevorteilten Partei zurückgewiesen.

Die dritte Studie, welche zur Publikation eingereicht wurde, untersucht in welcher Form finanzielle Ehrlichkeit mit einer dritten Person durch die kollektive Vorerfahrung distributiver Ungerechtigkeit in einer Gruppe beeinflusst wird. Die Ergebnisse zeigen, dass nach der Ungerechtigkeitserfahrung eine finanzielle Kompensation auch bei einer dritten, unabhängigen Person gesucht wird. Dieses Verhalten wird durch fehlerhafte Erwartungen über das Verhalten anderer Personen befeuert. Darüber hinaus sind ungerecht behandelte Personen bereit ihre

Ehrlichkeit noch weiter zu senken, wenn dies die Person finanziell schädigt, die zuvor die distributive Ungerechtigkeit verursacht hat.

Die Ergebnisse der vorliegenden Dissertation unterstützen die sprichwörtliche Weisheit, dass man die Vergangenheit Vergangenheit sein lassen sollte. Es scheint, dass das Verweilen in der Vergangenheit eine Rehabilitation verhindert und zu fruchtbarem Boden für Ersatzforderung sowie einer eigennützigen Auslegung der Vergangenheit führt.

List of publications and manuscript included in this dissertation and the authors' contributions

Dezső, L., & Loewenstein, G. (2012). Lenders' blind trust and borrowers' blind spots: A descriptive investigation of personal loans. *Journal of Economic Psychology*, *33*, 996-1011.

Authors' contributions:
LD conceptualized the study, designed the survey, managed data-collection, analyzed data, interpreted results, wrote up and revised the paper. GL supervised the study design, interpreting results and revised the manuscript.

Dezső, L., Loewenstein, G., Steinhart, J., Neszveda, G., & Szászi, B. (2015). The pernicious role of asymmetric history in negotiations. *Journal of Economic Behavior & Organization*, *116*, 430-438.

Authors' contributions:
LD conceptualized the studies, designed both experiments, conducted study 2, analyzed data from both experiments, interpreted results, wrote up and revised the paper. GL supervised designing the experiments, interpreting results and revised the manuscript. JS programmed study 2 in Flash, collaborated in conducting study 2, interpreted results and revised the manuscript. GN and BS conducted study 1 and assisted in conducting study 2.

Dezső, L, Steinhart, J., Saredi, V. & Kirchler, E. (submitted manuscript). Corrupted norms, compensation-seeking and punishment after experiencing inequity.

Authors' contributions:
LD conceptualized the study, designed the experiment, conducted the study, analyzed data from the study, interpreted results, wrote up and revised the paper. JS conceptualized the study, designed the experiment, analyzed data from the study, interpreted results and revised the manuscript. VS interpreted results. EK supervised interpreting results and revised the manuscript.

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Introduction[1]

The shadow of the past[2] can be persistent and far-reaching. What happened in past overshadows not only daily interactions, but also people's claims in negotiations (Camerer & Loewenstein, 1993) and their beliefs on the fair distribution of joint resources (e.g., Babcock, Loewenstein, Issacharoff, & Camerer, 1995; Cappelen, Hole, Sørensen, & Tungodden, 2007; Cappelen, Konow, Sørensen, & Tungodden, 2013; Konow, 2000). In situations in which interacting parties have a shared history, negative elements from the past seem to have stronger influence on subsequent behavior than positive ones (e.g., Charness, 2004; Offerman, 2002). An episode of being wronged is often followed by behaviors aiming to repair the loss or to restore equity in ways which may even harm the wrongdoer (e.g., DeMore, Fisher, & Baron, 1988; Fisher & Baron, 1982; Gino & Pierce, 2009; Greenberg, 1990, 1993), which are often supported by relaxed beliefs about the prevailing moral norms (e.g., Sharma, Mazar, Alter, & Ariely, 2014). At a broader, societal, level, social disintegration due to increased individual selfishness often hinders recovery after nations or groups were wronged (e.g., accompanying a loss in an international or civil war) (Grosjean, 2014). The memory of a collective loss (e.g., the territorial losses or economic sanctions imposed after WWI, or suffering from prior ethnic or religious aggressions) is often opportunistically invoked by leaders to justify retaliation towards the wrongdoer (e.g., Schweller, 1994).

The past is usually complex, and it can be recollected over and over, as beautifully summarized by Thomas Mann "Very deep is the well of the past. Should we not call it bottomless?" Because it is malleable, it is subject to permanent reconstruction not only at a personal (e.g., Bartlett & Burt, 1933; Conway & Pleydell-Pearce, 2000; Edwards & Middleton, 1987; Loftus & Davis, 2006; Neisser, 1994; Saito, 2003; Schacter, 1999) but also on cultural and societal levels (e.g., Gedi & Elam, 1996; Pennebaker, Paez, & Rimé, 1997; Schacter,

[1] Throughout this dissertation I use two different voices. When discussion my dissertation I use "I", when describing studies reported in the papers, I use the term "we" (since papers have co-authors).

[2] This dissertation employs the term "past" and "history" in an ordinary sense, not in a way it is often used in game theory. In this latter, when investigating and modeling strategic interactions history is related to reputation formation which summarizes past behaviors signals the person's type or gives hints about what to expect from the partner (e.g., Roth & Schoumaker, 1983).

1995). Events are recalled, reconstructed and often invoked in a way they best serve one's actual behavior. This motivated recall of memories (Kunda, 1990; Sanitioso, Kunda, & Fong, 1990) is assumed to protect the self (e.g., Neisser, 1981; Nigro & Neisser, 1983; Pizarro, Laney, Morris, & Loftus, 2006; Sedikides & Green, 2004, 2009), to maintain current or optimal psychological states (e.g., Harris, Sharman, Barnier, & Moulds, 2010), and to shield one from questioning or falsifying pleasant memories (e.g., Zauberman, Ratner, & Kim, 2009). Motivated recall also gives grounds for formation of egocentric beliefs about fairness (Babcock & Loewenstein, 1997; Messick & Sentis, 1979) or the moral norm (Sharma et al., 2014) in a given situation. In other words, memories are flexible assets that can be opportunistically used to favorably position their owners.

In certain interactions between parties, the history they share can be employed as a source of precedent, or as a litany of past wrongs that need to be righted. People may even cite their unfortunate history in interactions with someone new. The child's outbursts such as "she got what she wanted last time; now it's my turn," or "I just lost my truck, so I deserve the one sitting alone in the sandbox" are couched in more sophisticated language to justify more adult claims by history throughout life. Such situations can run the gamut from mundane squabbles between spouses negotiating about household chores or finances (e.g., Dezső & Kirchler, 2013), to complex international situations when states or nations wish to justify territorial threats or economic ultimatums (Murphy, 1990). In all such situations, such behaviors might further undermine mutual trust, cooperation and reintegration, and can impose additional inefficiencies to all involved parties.

This dissertation examines self-serving behaviors after experiencing an unfair loss in the past. In the first two chapters of this dissertation, I motivate the three papers. In chapter one, I provide a brief overview on how an adverse history shapes nations' or groups' social and political preferences. The upshot is that being wronged in the past is often followed by biased invocation of the past, which might take the form of a distorted collective memory or eroded social and political preferences that hinder recovery. In chapter two, I narrow the scope to history between individuals. Here, I provide a short review on how and why an adverse history between individuals prompts various self-serving behaviors, most importantly compensation-seeking and various egocentrically biased behaviors.

In chapter three, I discuss the specific predictions tested in each study as well as the

methodologies used for doing so. In chapter four, I present and discuss main results of the four studies. Finally, chapter five concludes by discussing results and the conclusions drawn.

Chapter one. The broad picture: History of nations or groups of people

A common history can conceivably play a constructive role for those involved. Under fortunate circumstances, collective memories are transmitted through generations, fostering bonding (observing Sabbath, for instance) or imparting a sense of belonging together (e.g., Assmann & Livingstone, 2006; Assmann, 2008). In addition, it has been shown that the maintenance of collective memories promotes the development of a collective or social identity (Tajfel, 1978), which then plays an important role in maintaining welfare institutions (e.g., Dessi, 2008). A shared history of misfortune, on the other hand, may adversely impact subsequent behaviors of those involved.

The severity of an adverse history can obviously range vastly. At the extreme, one might be traumatized in a war or natural disaster, prematurely lose loved ones, be abused in interpersonal relationships or experience marital crisis; or, less severely, one might lose wealth or be paid less than was expected or promised for some work. History can be collectively and equally shared among a group people or nations, such as with the Holocaust for European Jews or the Treaty of Trianon for Hungarians; or, it can be heterogonous among some group of people, such as the cronyism of communist regimes which favored certain people (or families) while torturing others (e.g., Dickson, 2003). How wronged nations or groups cope after an adverse event is important, because it determines the subsequent recovery of their state capacities,[3] which in turn play a key role in building and maintaining efficient institutions which, for instance, enforce contracts or create and implement policies (e.g., Besley & Persson, 2009, 2010). Rebuilding and consolidating societies might be at risk, however, if wronged people cannot take a future-looking perspective, instead choosing to linger on the past.

Scholars in political economy and economic and social history endorse two disparate views on how the shared experience of wars, conflicts or enduring violence shapes subsequent social

[3] Unlike the approach of historical sociologists (e.g., Tilly & Ardant, 1975) who use a narrow definition of state capacity focusing only on the capacity to collect tax revenue, the term is broadened here to a general fiscal capacity for enforcing contracts, etc.

behavior of those involved. Proponents of the *state-building view,* referring to the spectacular post-World War II recovery of Western-European countries, advance that inter-group competition and war are preconditions for state formation and political and institutional development (e.g., Tilly & Ardant, 1975). In sharp contrast, the *conflict-trap model,* proposes that conflict hinders development, leading to weak states at risk of further disintegration (e.g., Collier & Hoeffler, 2004). This outcome can be exemplified with the enduring legacy of WWII in the form of oppressive and autocratic regimes in many Eastern European and, later, post-Soviet countries. Both views are supported by field studies from regions having recently undergone violence (e.g., civil wars, ethnic or religious violence, etc.). One must keep in mind, though, that the results of such field studies are complicated by possible endogeneity or some underlying relationship between conflict and political preferences at the national or group level.

Field studies supporting the state-building view find a positive association between victimization and pro-social behavior toward those sharing this history. Blattman (2009) for instance, reported a positive association between elevated level of witnessing violence and subsequent political engagement in Northern Uganda. Similarly, Bellows & Miguel (2009) found a positive relationship between having a history of violence and being politically or socially active in Sierra Leone: those who personally experienced war violence were more likely to participate in collective actions such as community meetings, voting or contributing to public goods.

In sharp contrast, another strand of field studies provides empirical confirmation for the conflict-trap model. Prediger, Vollan, & Herrmann (2014), for instance, found increased antisocial (i.e., intentionally spiteful and hurtful) behaviors toward other members of in-group among Namibian pastoralists who suffered long years of resource scarcity. Or, when homogenous groups were created on each side of the Berlin Wall, East Germans cooperated less in a voluntary public goods game and showed decreased solidarity in a solidarity game than West-Germans, both before (Ockenfels & Weimann, 1999) and after the German reunification (Brosig-Koch, Helbach, Ockenfels, & Weimann, 2011).

In a theoretical piece on modeling state capacity, Besley & Persson (2010) propose a unified framework where details of the source and the outcome of the conflict influence which of these two responses will arise. Recently, Grosjean (2014) tested this distinction on a large, micro-level dataset comprising nearly 40,000 responses on representative samples from 35

European, Caucasian and Central Asian countries. The particular focus was the ways in which WWII, the civil wars in former Yugoslavia and the conflicts in North Caucasus and Tajikistan shaped social and political preferences. The study addressed the short- and long-term effects of different types of conflict on individual social and political preferences, focusing on the perceived legitimacy and effectiveness of institutions and social capital. The former are crucial in growth (e.g., Besley & Persson, 2009), post-conflict recovery (e.g., Bigombe, Collier, & Sambanis, 2000) and economic liberalization (e.g., Grosjean & Senik, 2011); and the latter is essential for institutional quality (Tabellini, 2010) and functioning markets (e.g., Fafchamps, 2007). To measure social capital, Grosjean (2014) followed Guiso, Sapienza, & Zingales (2010) by using the reported, generalized norms of morality as proxies of social capital. These norms, so they argue, prescribe the norm of cooperation and compliance which form a kind of compass for moral conduct.

The Grosjean (2014) study found decreased trust in and perceived efficiency of central institutions of wronged societies (e.g., those losing international wars, suffered from civil wars, etc.). The author also provides a close-up view on the nature of the increased, post-violence participation in collective actions as documented by Bellows & Miguel (2009) and others. Grosjean (2014) did find increased participation in collective action and political parties among those victimized in WWII or recent civil war, for instance. However, a detailed analysis of the interaction between institutional trust, victimization and activity in collective action revealed a dark side to political involvement. It seems that the collective action, which is promoted by victimization in civil war or international conflict is of a kind that is associated with eroded institutional trust and norms. In other words, experiencing conflict triggers bonding rather than bridging social capital – the kind that hinders rather than facilitates growth and recovery. This is consistent with recent findings on the negative potential of bonding social capital in interwar Germany (Satyanath, Voigtlaender, & Voth, 2013) which eased the spread of and engagement with Nazi ideology.

All in all, the dark legacy of an unfortunate history has been shown at the level of nations and countries. Decreased trust in institutions, eroded beliefs in norms, bonding rather than bridging social capital, and collective action to benefit the few all seem to hinder recovery and integration.

One may ask what specific individual behaviors and motivations result in these large-scale

effects. In the next chapter I review the key literature on individual behaviors after an unfortunate history, in order to motivate the three papers of my dissertation and to provide a literature framework for the studies reported therein.

Chapter two. The narrow picture: History between individuals

The concept of history used in this dissertation is less complex than what is used in political economy or in economic history. In addition, the kinds of interpersonal history examined and manipulated in the three papers are clearly far from anything resembling victimization in war or violence. Nevertheless, insights on how experiencing loss via conflict shapes social preferences and leads to various self-serving behaviors on the grander scale, provide an important starting point for examining individual behavior after an adverse history.

The narrow scope of history examined in this dissertation is between two individuals (in paper 1 and 2) or between an individual and a group of people (paper 3), and involves some inequity. Specifically, in study 1, presented in paper 1, one party (the lender) experiences an unfair loss because the other party (the borrower) breaks his promise to repay an interpersonal loan in the agreed-upon fashion. In studies 2 and 3, both presented in paper 2, one party of a dyad (the loser) does not receive any remuneration from some earnings jointly created with the other party (the winner). This is because the winner was granted with the whole amount via an unfair allocation schema. Finally, in study 4, a group of people incurred an unfair loss because an outside party violated the tacit fairness norm of choosing pro-socially rather than selfishly. Hence, history between focal individuals in studies 1, 2 and 3 is asymmetric, whereas history among focal individuals in study 4 is symmetric.

The general framework of investigating individual behavior throughout the three papers is the recognition that falling below some kind of expectation creates the experience of loss. This idea was advanced by early social psychologists (e.g., Adams, 1966; Homans, 1974), arguing that after an inequitable treatment, people engage in behaviors aiming to repair the loss or even restore equity by getting even with their wrongdoer. The fact that people behave differently after gains versus losses was also recognized and formalized in the seminal paper by Kahneman & Tversky (1979), creating a framework in which disparate behaviors after gains and losses can be predicted and tested.

In distributive situations, which fairness norm was applied was applied seems to be just as important as the actual monetary outcome (Loewenstein, Thompson, & Bazerman, 1989). If an unfair outcome (for instance, a low offer in an ultimatum game) is intentionally imposed rather than caused by chance (i.e., bad luck), people are more prone to retaliate (Blount, 1995). When there is no rationale against being pro-social or nice, people expect the person in the advantageous position to refrain from full self-interest and be nice. If this expectation is violated, beyond experiencing a material loss, people also feel anger or spite against the dividing party, which – if there is scope for reciprocity – can drive them to revenge (e.g., Pillutla & Murnighan, 1996). There is, however, a bias toward negative reciprocity. Studies investigating the frequency and intensity of negative and positive reciprocity after unkindness and kindness, respectively, find consistently that negative reciprocity is not only more frequent but more severe than its positive counterpart (e.g., Falk et al., 2008; Offerman, 2002). This suggests that adherence to some kind of implicit fairness rule is expected by default and any disadvantageous deviation from this calls for retaliation. This significance of fairness intentions has been incorporated into economic models on reciprocity to capture the different reactions to outcomes of intentional versus unintentional attributions (Charness, 2004; Falk et al., 2008; Offerman, 2002; Rabin, 1993).

Observable behavior: Compensation-seeking

Along the lines of equity theory, being subjected to an inequitable or unfair treatment may push people into a selfish mode, leading to behaviors meant to repair some or all of their loss, possibly accompanied by the willingness to restore equity by inflicting harm on the wrongdoer.[4] These reactions to unfairness have been documented in the field and in the lab.

Field studies on organizational behavior support equity theory. After reviewing one-hundred thirty two, first-person accounts of workplace sabotage activities, Ambrose, Seabright, & Schminke (2002, p. 960.) found that perceived distributive injustice in organizations is ”associated with sabotage behavior that aimed to restore equity”. Perhaps the most everyday example of experiencing an unfair loss is being paid less than what is expected or promised, or

[4] For a more detailed review on the differences in compensation-seeking with and without negative reciprocity see e.g., Stillwell, Baumeister, & Del Priore (2008); and on the motivations behind punishment see, for instance, Bone & Raihani (2015)

the believed fair wage. Consistently, scholars in organizational and management research advance that the key predictor of pay-dissatisfaction among employees is their belief of how much they should have received (Williams, McDaniel, & Nguyen, 2006). In a large-scale field study of employees, Greenberg (1990), for instance, found that underpaid workers resorted to inventory thefts to compensate their losses. Similarly, Nagin, Rebitzer, Sanders, & Taylor, (2002) report that call center workers who feel inequitably treated cheated their employers less.

Findings in lab experiments are consistent with the field results. Zitek, Jordan, Monin, & Leach (2010), for instance, demonstrated that even just recalling a past experience when one was unfairly treated made people behaving more selfishly. Or, after experiencing financial deprivation (directly or just by recalling), people cheated more on subsequent tasks if doing so increased their earnings (Sharma et al., 2014). Furthermore, Gill, Prowse, & Vlassopoulos (2013) demonstrated that when people are remunerated for some kind of real-effort task in the lab, those who are subject to a random bonus payment schema cheat more than those assigned to a fixed payment schema. Relatedly, in a two-stage lab experiment, Houser, Vetter, & Winter (2012) demonstrated compensation-seeking behavior through cheating, even when the unfair previous outcome was due to chance rather than intentions.

Similar behavioral findings are seen in studies examining compliance in income-reporting games, which are used as a proxy for tax behavior (for theoretical pieces see e.g., Andreoni, Erard, & Feinstein, 1998; Schnellenbach (2010) and for empirical studies see, for instance, Bazart & Bonein, 2013; Fortin, Lacroix, & Villeval, 2007; Spicer & Hero, 1985). The typical finding is that people react to some prior or ongoing inequity (e.g., an abrupt increase in tax rate or an unfair tax system) with decreased compliance toward the entity responsible for the inequity.

In cases in which the unfair treatment is perceived to be intentional, compensation-seeking is often accompanied with negative reciprocity to get even with the wrongdoer. Greenberg (1993) demonstrated in a lab study that workers who were paid less than promised engaged in subsequent equity restoration by stealing from the experimenter who broke his promise.

Along these lines, recent research shows how subjective experiences of financial deprivation shapes one's behavior. Subjective well-being is captured as feelings and thoughts about one's own financial state and conceptualized on a continuum ranging from "better off" to "worse off" (e.g., Diener, Suh, Lucas, & Smith, 1999). This implies some kind of comparison

to a benchmark, be it some other comparable person, an expectation or just a perceived norm. Consequently, people may experience financial deprivation when they perceive that their position is relatively inferior (Sharma & Alter, 2012). This might provoke them recuperate by any available means. In three studies, Briers, Pandelaere, Dewitte, & Warlop (2005), for instance, demonstrate that hungry people are less likely to donate and have a greater desire to make money than non-hungry ones, indicating some kind of fungibility between financial and caloric scarcity. Similarly, males from cultures with scare resources prefer heavier women than those from thriving cultures (Nelson & Morrison, 2005). In a series of lab studies, Sharma et al. (2014) found that even just recalling a personal experience when one felt financially deprived leads to increased subsequent cheating.

In bargaining studies, the mere presence of asymmetry (in the absence of any history) can also trigger compensational claims. Experiments of this kind consistently find prolonged bargaining and increased frequency of impasse because the disadvantaged party claims compensation which is denied by the party with the upper hand (e.g., Birkeland, 2013). Or, when parties negotiated on how to divide lottery tickets which determined their chances to win unequal monetary prizes, the party with the lower potential prize asked for a greater winning probability in compensation (Roth, Malouf, & Murnighan, 1981; Roth & Malouf, 1979). Similarly, in a "shrinking pie" game in which the pie shrank faster for one party than for the other, the party with the greater discount rate insisted on a greater share (Weg, Rapoport, & Felsenthal, 1990). In fact, in a very sophisticated examination of compensation-seeking behavior in distributive situations (Cappelen et al., 2007; Cappelen et al., 2013; Cappelen & Tungodden, 2013), report that when claiming or granting compensation, people also take into account what caused the disadvantage. They find that people are willing to compensate for a disadvantage due to bad luck, but not one due to an intentional choice.

Building upon research into compensational claims in bargaining behavior, studies 2 and 3 tested whether bargaining parties who shared an asymmetric history would be more likely to hit an impasse than parties sharing a symmetric history. Specifically, given an asymmetry where one member of a dyad was chosen to receive all of a jointly generated sum, we tested whether the party who had received nothing would claim compensation in a subsequent bargaining over newly created, joint resources. Taking this one step further, we tested whether this losing party would seek compensation only from the same party who had won at his expense, or whether this

claim for compensation would extend to anyone who had previously won (i.e., at someone else's expense).

Building upon research into compliance behavior after experiencing inequity, Study 4, presented in paper 3 of this dissertation, contributes to the literature on compensation-seeking and negative reciprocity. We predicted and found that people subjected to an inequitable treatment would subsequently under-comply with a party unrelated to the unfairness if doing so repairs some of the loss. Additionally, if a critical level of under-compliance could inflict an indirect financial harm on the wrongdoer, people were ready to further decrease their compliance into this critical level.

Personal accounts of feelings, memories and beliefs

This dissertation also examines introspective reports on self-serving behavior (e.g., biased recollection of an episode, biased acknowledgement and assessment of one's deviant behavior) and compares stated beliefs (e.g., about relevant norms) with observable behavior like bargaining claims and compliance behavior. The key interest is the presence and extent of egocentric accounts of an episode or egocentrically-formed beliefs about pertinent norms. However, because a wide range of introspective accounts are examined, it must be noted that behavioral economics and psychology differ on methods for eliciting information about internal states such feelings, thoughts and beliefs.

One of the main differences is that psychologists generally ask participants to report their thoughts, feelings or beliefs, which are then taken for fact, whereas in behavioral economics the elicitation is incentivized in order to avoid any kind of strategic behavior such impression-making or behavioral justification. In the specific contexts of cheating and lying, psychological studies simply ask participants to report what they think the relevant norm is (e.g., Sharma et al., 2014). Similarly, in studies on motivated cognition, psychologists ask participants to recollect a focal interaction and report their assessment of it along with associated feelings (e.g., Sanitioso et al., 1990). Note however, that choosing the proper belief elicitation method for a given design is almost a subfield of its own (for details on this see, for instance, Trautmann & van de Kuilen (2014)).

Psychological research on the reconstructive nature of memory suggests that memories are

flexible assets, ready to serve one's goals and protect one's self (Bartlett & Burt, 1933; Baumeister, Stillwell, & Wotman, 1990; Conway & Pleydell-Pearce, 2000; Conway, 2005; Edwards & Middleton, 1987; Kunda, 1990; Sanitioso et al., 1990; Schacter, 1999). The many degrees of freedom that the mind enjoys when it comes to encoding and retrieving memories provide fertile ground for egocentric or self-serving interpretation of the past (Ross, McFarland, Conway, & Zanna, 1983) and judgments of moral conduct (e.g., Pizarro et al., 2006). Shu, Gino, & Bazerman (2011), for instance, found that when people act unethically, they recall fewer moral rules. This strategic recall (or strategic forgetting) is because, rather than just recalling exact copies of stored memory traces, recollection is egocentrically guided by current goals and aims to maintain a positive self-image (Mischel, Ebbesen, & Zeiss, 1976; Pieters, Baumgartner, & Bagozzi, 2006; Ross & Sicoly, 1979; Sedikides & Green, 2004, 2009).

In psychological research, the term *egocentric bias* encompasses a variety of judgmental biases that include the tendency to believe (or at least to report) that we are better than average on desirable traits, we lack many socially undesired traits, and we are overly optimistic about our future (Colvin, Block, & Funder, 1995; Gilovich, 1991; Perloff & Fetzer, 1986; Svenson, 1981; Weinstein, 1980, 1982), or good things happening to us are due to our merits (Nisbett & Ross, 1980; Ross & Sicoly, 1979). Psychological research advances that these egocentric biases are partly results of motivational mechanisms, such as the desire to maintain one's positive self-image (Aronson, 1969; Collins, 1996; Greenwald, 1980).

Research on social cognition documents how people are reluctant to acknowledge (or at least to report) the negative consequences of their behavior on someone else, and often hold self-serving or egocentric views on this matter. The term *blind spot* describes this tendency of people to judge themselves and their own behavior more positively than they judge others' behavior (Pronin, Gilovich, & Ross, 2004; Pronin, 2008). Particularly, people point out biases in others' behavior while they show far more laxity towards their own (Pronin, Lin, & Ross, 2002). Good examples of this are when people believe that their motivation is more selfless than others' (Epley & Dunning, 2000; Miller & Ratner, 1998), or how they are more likely to be lenient towards their own morality than others' (Shu et al., 2011).

Study 1 reported in paper 1, builds on the psychological findings on egocentric bias in recollecting episodes, reporting feelings, thoughts and on research into blind spots. In this study, lenders and borrowers recall issues and circumstances surrounding the lending episode

and report their feelings and thoughts about its consequences. Results gave insights into the opportunities for self-serving in the domain of interpersonal lending, which can eventually ruin the relationship between partners.

In a contrast, the methodological tradition of behavioral economics applies strict rules about how to properly incentivize belief elicitation. These studies usually investigate which fairness norm was endorsed whilst displaying a behavior in distributive situations (e.g., Konow, 2000) or what people believe about others' cooperative preferences in situations prompting cooperation (Fischbacher & Gächter, 2010). Even when the opportunity for strategic self-presentation or justification is eliminated, studies report a considerable heterogeneity of beliefs across individuals about the relevant norms of fairness or ethical conduct in a given situation. Such a plurality also emerges when impartial (i.e., those with no stakes in the actual distribution) spectators report their beliefs about decisions. One robust finding of these studies is that even impartial spectators believe that it is fair to compensate a disadvantaged party, especially if the disadvantage is due to something out of his control (Cappelen et al., 2007; Cappelen & Tungodden, 2013; Konow, 2005). This is consistent with psychological findings that beliefs about a pertinent fairness norm are subject to some kind of flexibility even when the person does not have stake in the choice.

In simple distributive situations (e.g., dictator game) when stakeholders in asymmetric positions propose divisions, they often base their claim on the fairness norm that benefits them the most (Croson & Konow, 2009; Konow, 2000; Rodriguez-Lara & Moreno-Garrido, 2012). Similarly, in bargaining situations when partners share some kind of asymmetry, settlement is often delayed or unsuccessful because the person in the disadvantaged position insists on being compensated and endorses the fairness norm that benefits him the most (e.g., Messick & Sentis, (1979); for contextually rich situations involving asymmetry see, for instance, Babcock, Loewenstein, Issacharoff, & Camerer (1995); Babcock, Wang, & Loewenstein (1996); Babcock & Loewenstein (1997); Loewenstein, Issacharoff, Camerer, & Babcock (1993) and Thompson & Loewenstein (1992).)

There are some cases, however, where beliefs actually cause people to refrain from fully indulging a selfish motive. Research on cheating and lying (e.g., Cappelen, Sørensen, & Tungodden, 2013; Fischbacher & Föllmi-Heusi, 2013; Shalvi, Handgraaf, & De Dreu, 2011) consistently finds that people refrain from entirely exploiting a situation, even when there is no

putative consequence of doing so. This trade-off is important, because it may explain for instance why people pay their taxes even though the cost of evading is minimal (Alm & Torgler, 2011; Frey & Togler, 2007); or why, when honesty norms are made salient, they pay some money for a newspaper that can also be obtained without payment (Pruckner & Sausgruber, 2013); or why they keep their promises (Vanberg, 2008). This balance between material gain and adherence to some kind of believed norm partly explains why most people only partially cheat in situations where there is no cost of cheating (e.g., Shalvi et al., 2011), or why they pay their taxes when evasion is almost costless (Frey & Togler, 2007).

Nevertheless, which moral norms are relevant is not carved in stone and, as with reconstructed memories, people adjust them flexibly. In fact, when people engage in questionable behaviors to compensate their losses, they are prone to relax their (reported) norms about what is acceptable (e.g., Sharma et al., 2014). But because these studies did not incentivize the beliefs elicitation procedure, it is hard to tell whether reported beliefs are just post hoc justifications of one's behavior, or rather true, self-serving beliefs (for differences on this issue see, for instance, Konow (2000)). To specifically address the role of beliefs in unethical behavior, we employed beliefs elicitation procedures as used in behavior economics. Therefore in study 4 (reported in paper 3), we elicited incentivized beliefs about the relevant norms in the situation (for similar methods see, for instance, Croson, 2007) while aiming to avoid a hedging problem that may arise for risk-averse participants trying to offset their potential losses when stating their beliefs (e.g., Blanco, Engelmann, Koch, & Normann, 2010). This allowed us to precisely determine the role of beliefs when under-compliance is a way to seek compensation.

Chapter three. General overview of the studies reported in the papers

This dissertation investigates the potentially destructive role of history in a variety of economic behaviors across four studies. Because the studies were each designed to address specific questions and have methodological differences, this chapter gives a brief overview of the predictions and methods of each.

Study features

Table 1 summarizes the key features of each study, including the specific predictions of each. Study 1 addresses predictions arising from the general framework of strategic reconstruction of the past and self-serving beliefs about the future in lending and borrowing interactions. Studies 2 through 4 address predictions arising from equity theory. The key behavior of interest is compensation-seeking.

As shown in Table 1, Study 1 was an online survey, asking 971 respondents about their most recent interpersonal lending and borrowing experiences (e.g., loans from friends, partners, siblings – explicitly excluding commercial loans). In this survey, we relied on participants' recollections of the lending episodes and their responses to various questions revolving around the loans' characteristics, the circumstance of the lending episodes, and various feelings and assessments about themselves and about the other party (see column five of row one). Hence, an asymmetric history emerged naturally between people here. Predictions (see column six of row one) involve the egocentrically biased recollection of the focal episode and various biased reports about one's feelings, future behavior and assessment of the other party.

Rows two and three of this table show the details of studies 2 and 3. Since these studies were interrelated and shared predictions, I discuss them as one (and in fact their results were also pooled and analyzed together). In these studies, we manipulated history between dyads. In one condition, they shared a symmetric history, while in two other conditions they shared an asymmetric history. Note, however, that these manipulated histories were due to an unfair allocation scheme rather than to any personal performance, traits, or history (the latter as in Study 1). As one can see from column three of rows two and three, these were both lab experiments, although study 1 was paper-and-pencil, while study 2 was computerized. These studies involved dyadic negotiations and, hence, we only obtained behavior measures. The key

predictions were that when people who share an unfairly-generated, asymmetric history negotiate on how to divide a jointly generated resource, the party who was the loser in a previous distribution would claim and insist on compensation from the party who was the winner in a previous distribution.

Finally, row four presents the details of study 4. This paper-and-pencil lab experiment measured compliance behavior towards a party unrelated to one's adverse history. Here, the history of being subjected to an unfair treatment was shared and homogenous among a group of people. We expected (see last column) that when people collectively experienced an unfair treatment, they would seek compensation in a subsequent situation wherein they were asked to comply with a party unrelated to their history, and that this under-compliance would be fueled by eroded beliefs about the pertaining norms. In addition, if under-compliance below some critical level could indirectly harm the wrongdoer, we predicted that people would be ready to decrease compliance to this level, even at the price of going below their already eroded beliefs about the norms.

Table 1. Summarizing specific features of the four studies

Study	Paper	Method	N	Measures	Specific predictions
1	1	Online survey	971	1. Various characteristic of the loans 2. Perception of the lender-borrower relationship 3. Recollection of the lending situation 4. Outcome of the lending episode 5. Self-serving reframing of the loan 6. Self-serving reassurance of the outcome 7. Helpfulness and burden of the loans 8. Feelings associated with the loans and lending episode 9. Various reported consequences of the lending episode on oneself and predicted on the other	1. There will more lending than borrowing episodes recalled. 2. Borrowers and lenders will have incongruent memories about the loans' sizes and how long ago they were made. 3. Borrowers will be more likely to report that lenders initiated the loan. 4. Lenders will be more likely to remember that the agreed upon repayment date passed than borrowers. 5. Lenders will be more likely to report that the loan is unpaid. 6. Lenders will be more likely to report that loan in unpaid and the agreed repayment deadline is passed. 7. Borrowers will be more likely to report that the loan was more of a gift than lenders. 8. Borrowers will hold more optimistic beliefs about them repaying the loan than lenders do. 9. Lenders and borrowers will both show biased perspective about the other party's behaviors and feelings.
2	2	Paper-and-pencil lab experiment	154	1. Bargaining impasse 2. Bargaining claims	1. Parties sharing asymmetric histories (i.e., one party was a loser and the other was a winner in a previous resource distribution) will be more likely to impasse than those sharing symmetric histories. 2. Parties sharing asymmetric histories will be more likely to impasse than asymmetric parties who do not share histories. 3. Bargaining impasse will be due to 3.1. The loser party claiming compensation from the winner party who does not welcome this claim. 3.2. The loser party insists on compensation while the winner party insists on not giving the compensation.
3	2	Computerized lab experiment	238		
4	3	Paper-and-pencil lab experiment	120	1. Compliance-level 2. Beliefs about mean group compliance-level (i.e., proxies for believed norm)	1. Under-compliance with a third party will be increased after experiencing inequity. 2. Beliefs about the others behavior (i.e., norm) will be eroded after experiencing inequity. 3. Eroded beliefs will drive under-compliance after experiencing inequity. 4. If a critically low level of under-compliance can punish the wrongdoer, people will target their compliance into this zone. 5. Punishment through under-compliance will imply going below one's believed norm.

Methods applied in each study

Before presenting results of the four studies, it is necessary to elaborate to some extent on their respective methods. The methodological differences are important for at least three reasons. First, they determine the specific questions each study could address. Second, they circumscribe the possible applications and implications of the results. Third, they give directions on the limitations of each study.

Study 1[5]

This survey was fielded in 2011 on Amazon's MTurk service. Respondents, screened to be US citizens, received $0.5 for completing the survey. The survey was administered via Qualtrics and took approximately 20 minutes to complete. Respondents were randomly assigned to one of two surveys that varied only in whether it asked first about a situation in which the respondent had lent money and then a situation in which they had borrowed money, or vice-versa. For both the lending and borrowing portions, participants were asked about the most recent loan they have been involved in the past five years. If the participant indicated no lending or borrowing episode, then the corresponding section was skipped. All respondents then answered the demographics questions.

The lending and borrowing sections of the survey contained equivalent questions that were divided into two main sets of questions. The first set inquired about the characteristics of the loan, such as its size, how much had been paid back, when the loan was made, the presence of interest, the existence of a formal contract (e.g., 'IOU'), the purpose of the loan, and a brief description of the lending situation, as well as subjective questions about the degree to which the loan was helpful to the borrower, and the degree of sacrifice it entailed to the lender. If the loan was unpaid, respondents were asked whether they believed that the loan would ever be paid back. Finally, the survey asked about specific feelings associated with the loan (e.g., happiness, anger, guilt, relief, feeling upset, anxious, and losing sleep over the loan).

In the second set of questions for each section, we asked about the relationship between the borrower and lender and the history of interactions between them. Furthermore, we inquired

[5] Note, this section heavily builds on and to some extent paraphrases the methods section of Dezső & Loewenstein (2012).

about the person's age, the duration of the relationship, and details of past borrowing and lending activity between the parties. Moreover, we included questions about the respondents' feelings of closeness towards the partner both at present and prior to the loan, and their perceptions of their loan-partner's current and prior feelings of closeness to them. In addition, as a measure of some kind of paranoia, we also asked both parties whether they are avoiding encounters with the other party and whether they believe the partner is doing so. We also asked if they would be willing to be involved in borrowing from or lending to the other party again, and, for unpaid loans, how often the lender reminded the borrower of the need to pay back the loan. Finally, we asked lenders whether their trust in the borrowers had changed as a consequence of the loan, and asked borrowers about whether the lender's trust in them had changed.

Study 2 and 3[6]

In both of these experiments, anonymously paired subjects interacted in two consecutive stages. In both studies, two subjects were paired and negotiated over how to divide a sum of money that was jointly generated by giving correct answers to trivia quizzes. In both studies, history was experimentally established between dyads as the result of an unfair distribution of stage 1 joint earnings. In study 1, this history was either asymmetric or symmetric, whereas study 2 focused only on asymmetric pairs.

In the first (manipulation) stage of both studies, all subjects completed a trivia quiz and each individual's production was determined based on their quiz performance (i.e., number of correct answers times pay-rate). Note, the trivia quizzes were selected so that there should be no systematic differences across subjects. Next, these individual productions were pooled within each pair. In the symmetric condition (only in study 2), the pooled production was then split evenly between both subjects. In the asymmetric conditions (studies 2 and 3) the entire joint production was given to the subject who had scored higher on the trivia quiz, or, in the event of a tie, to the randomly selected winner. Subjects only learned about this allocation schema when the history manipulation was established, at the moment of allocation.

In study 1, parties from stage 1 were paired again for stage 2, yielding symmetric same-partner and asymmetric same-partner conditions. In study 2, however, one half of the subjects

[6] Note, this section heavily builds on and to some extent paraphrases the methods section of Dezső, Loewenstein, Steinhart, Neszveda, & Szászi (2015).

were paired with somebody different than their stage one partner, ensuring that we only get winner-loser dyads. In all conditions subjects were reminded or informed of their new partners' histories. Hence, study 2 employed asymmetric same-partner and asymmetric different-partner conditions. In this second (measurement) stage, both subjects again completed a trivia quiz and then negotiated a division of their joint production from this second stage. In both experiments, immediately after both quiz submissions (stage 1 and 2), we asked subjects to provide estimates of the minimum and maximum they believed they could have scored in that game, as a view into their own estimated contributions to the joint production.

This second stage involved the actual negotiation of interest. The negotiation unfolded in maximum two rounds, as a double-auction style of bidding. In each round, parties submitted their claims, but they never learned how much the other claimed. If the summed claims were less than or equal to the pie, then agreement was reached. If not, parties entered the next round. In cases when no agreement was reached after two rounds, the pie shrank by 20% and the remainder was randomly (with every division equally likely) divided between parties.

A survey concluded both studies. Final earnings were contingent upon performance. There was no show-up fee.

Study 4[7]

The paper-and-pencil (i.e., not computerized) experiment was embedded within a neutral context and was conducted by assistants uninformed about the goal and hypothesis. Participants received all instructions and tasks in a leaflet, and were instructed to proceed page-by-page, only when prompted. Generic instructions were also announced by the assistants. Each session involved only one of the conditions, and participants were randomly assigned to a session.

The experiment employed three conditions and unfolded in two stages. The first condition, henceforth *baseline condition*, lacked any manipulations. The second, henceforth *inequity condition*, included the inequity manipulation. The third, henceforth *punishment condition*

[7] Note, this section heavily builds on and to some extent paraphrases the methods section of Dezső, Steinhart, Saredi, & Kirchler (2016, submitted manuscript).

included the inequity and the punishment manipulations. In stage one, participants did not know about the subsequent stage two.

The goal of stage one was for participants to learn their role in the experiment, generate income, and to state their risk attitude by filling out the low-payment version of the Holt & Laury (2002) survey. For us, the goal of this stage was to establish the inequity manipulation in the two experimental conditions (i.e., inequity and punishment). In the baseline condition everyone was assigned the role of the *group member* and participants were pooled into a group of ten. In the inequity and punishment conditions, one subject was anonymously and randomly assigned to the role of the *piece-rate decider*, and the others (always ten participants per condition) were assigned to the role of group member.

Group members generated their stage one income by answering a ten-item trivia (i.e., knowledge) quiz. Each correctly answered quiz question yielded a piece-rate, which was unknown to group-members until the end of stage one. The piece-rate decider in the two experimental conditions generated his/her income by implementing the inequity manipulation.

The inequity manipulation was implemented by the piece-rate decider. S/he was given the choice of assigning either a low (i.e., 100 HUF) or a high (i.e., 500 HUF) piece-rate for each trivia question answered correctly by the others.[8] His/her incentives were misaligned with those of the group, such that for selecting the low piece-rate s/he would be paid 2000 HUF, versus only 100 HUF for the high piece-rate. To avoid strategizing by the decider, s/he was unaware of stage two when making the piece-rate decision. Note that, in order to keep the piece-rate equal between conditions, sessions of the baseline condition were conducted last.

Stage two measured compliance with a party unrelated to the subjects' history in an income-reporting game with no redistribution (e.g., Alm & McKee, 2004). That is, people were asked to report their true stage one earnings (which was a private knowledge) from which 25% was deducted. They could report anything between zero and their true earnings. They faced a 15% probability of being checked on whether they had declared their true income. If they were caught under-reporting, they would have to pay 50% of the undeclared amount. The occurrence and outcomes of any check would remain, however, a private knowledge. We also elicited incentivized beliefs about the mean group compliance following protocol, for instance, from Croson (2007). Elicited beliefs were proxies for perceived norms. Since beliefs about others'

[8] HUF=Hungarian Forints. One USD was approximately 270 HUF at the time of the experiment.

behavior were of key interest, participants were treated in groups of ten and answered questions about their beliefs of the mean behavior within their group.

Chapter four. Reviewing results of the four studies

In this section I briefly summarize main findings of the four studies. Detailed results, supporting tables and statistics are found in each paper.

Summarizing study 1 results

When analyzing responses from study 1, we focused on lending episodes rather than on respondents since some respondents may have reported both lending and borrowing, while others only one or the other. Furthermore, we excluded asymmetric loans (given by a parent or grandparent to a child or grandchild, respectively) since we assumed that here might be other factors interfering with or confounding egocentric bias. Hence, we ended up having 361 lending and 293 borrowing episodes reported to have been made in symmetric relationships (e.g., between siblings, friends, significant others, co-workers, fellow students, etc.).

Predictions revolving around the strategic recall of interpersonal loans (see Table 1, predictions 1 through 3 for study 1) were supported. There were significantly more lending episodes recalled than borrowing ones. In addition, borrowers and lenders had incongruent memories about the details of the loans. First, lenders have longer memories for loans than borrowers. Second, average reported loan sizes are larger for borrowers than for lenders, suggesting that a loan had to be big enough for the borrower to remember. Put differently, small loans are less likely to be recalled by borrowers than by lenders. In addition, borrowers were more likely to report that the loan was initiated by the lender than lenders were. Further evidence for self-serving recall comes from the finding that borrowers underestimated the pressure felt by the lender to provide the loan.

Another set of predictions (predictions 4 through 6) dealt with the perceived status of the loans. When addressing these predictions, we classified the loan statuses based on whether the repayment date passed and whether the loan had been paid or not. In addition, we created

another classification describing the precise status of the loans: completed (i.e., paid off on time), diligent (i.e., paid off before repayment date), in-process (i.e., repayment date is unpassed and unpaid) and delinquent loans (i.e., repayment date passed and loan is unpaid). Predictions about the biased reports on the loan statuses were also borne out. Borrowers were less likely than lenders to report delinquent loans, whereas borrowers were more likely to report diligent ones.

When investigating self-serving interpretation of the loan (predictions 7 and 8) we found that borrowers were more likely to report that a delinquent loan was more of a gift than a real loan, and that delinquent loans would eventually be paid off.

Finally, as predicted, borrowers and lenders had incongruent interpretations of and perspectives on how a delinquent loan impacted the lenders' feelings, behaviors and trust in the borrower. Specifically, borrowers do not want to acknowledge subtle reminders from the lender about the need of repaying the loan. Lenders reported that the borrower is avoiding them, while borrowers did not report this. Most surprisingly, however, borrowers overestimate the likelihood of the lender loaning to them again.

Summarizing Study 2 and 3 results

Results from the two experiments were pooled and analyzed together. The key prediction was that parties in the asymmetric same-partner condition were more likely to reach impasse than those in either the asymmetric different-partner, or the symmetric condition (prediction 1 and 2 presented in row two and three of Table 1). Note, that this prediction pertains to pair-level rather than individual-level data. Consistent with this prediction, 27.7% of asymmetric same-partner pairs reached impasse, versus only 7.7% and 8.6% in the symmetric and asymmetric different-partner conditions, respectively.

When investigating the individual-level behavior, one can gain insights into the etiology of the behavior observed on the pair level. In the asymmetric conditions, there were four individual-level cells formed by crossing the stage 1 outcome (lost/won) with stage 2 pairing scheme (same of different partner). In the symmetric condition there were no winners and losers and therefore no individual-level differences. Results show that in the second (i.e., final) round of negotiation, losers in the asymmetric same-partner condition claimed the greatest

proportion of the pie and insisted on these claims, and this intransigence was the cause of the increased impasses among asymmetric same-partner pairs.

Summarizing Study 4 results

The focus of this study was threefold. First, it addressed if collectively experiencing inequity would lead people to seek compensation via under-compliance with a party unrelated to their history. Second, it aimed to clarify the exact role of beliefs in under-compliance after having being treated unfairly. Third, it tested whether people would further decrease compliance to a level where it could indirectly harm their wrongdoer, even at the price of going below their beliefs about what others are doing.

The ratio of the declared to true income, ranging from 0 to 1, was a proxy for compliance behavior. Results mostly supported our predictions. On average, compliance and beliefs decreased after experiencing inequity, and compliance further decreased when punishment through lowering compliance was possible. When, however, punishment was possible by decreasing compliance into a critical low zone, people were more likely to comply in this zone. In a more detailed analysis of compliance behavior and the role of beliefs, we separately analyzed how experimental factors influenced the behavior of zero, partial and full compliers.

Zero compliers were those who declared zero income, full compliers declared their full income, partial compliers (most of the subjects) declared something in between. Our main finding is that mean compliance among partial compliers decreases after experiencing inequity and further decreases in the presence of punishment. However, when we add beliefs to the model, the effect of inequity disappears, while beliefs seem to be positive associated to compliance. Further entering risk aversion into the model shows that increase in risk aversion is associated to increase in compliance. When separately investigating the likelihood of becoming a zero over a partial complier, we again find that the presence of inequity increases the odds but only until we add beliefs to the model. The same holds for the likelihood of becoming a full complier over partial complier. Note, risk aversion was not associated to these latter two likelihoods.

Mediation analysis gave an in-depth insight on the role of beliefs after experiencing inequity and in the opportunity to punish. It seems that the effect of inequity was fully mediated

by decreased beliefs, while the effect of punishment stands alone. This implies, that compensation-seeking behavior is entirely driven by corrupted beliefs about the norms, while retaliation is separate from beliefs.

Further analyzing the role of beliefs in punishment we engaged in some speculation. Building on literature on the psychological cost of deviating from one' beliefs, we adopt the idea that a negative deviation from (i.e., going below) one's beliefs inconveniences people, resulting in some kind of psychological cost. Comparing the inequity and punishment conditions, we tested the difference between the proportions of those who believed that others would comply above the critical low zone (which corresponds not punishing the wrongdoer) but yet complied in the low zone (which corresponds to punishing the wrongdoer). If this proportion is greater in the punishment than in the inequity treatment, we can say that the opportunity to indulge spite pushed people into violate their beliefs about the norms. Although the proportions favored this assumption, the test fell short of statistical significance.

Chapter five. Discussion, conclusions and limitations

Although history can conceivably play a constructive role between people, binding them and bringing them into a mutual understanding, the studies reported in this dissertation demonstrate the pernicious potentiality of history in various economic behaviors.

Results demonstrate that when parties share an unfortunate history, motivated recollection of autobiographical memories can bias recall, leading to divergent interpretations about what happened and how. This is supplemented with egocentrically biased interpretation of one's questionable behaviors, likely to eliminate responsibility and avoid tarnishing one's self-image. Furthermore, when one party was responsible for the unfair history, he seemed to be motivated to avoid acknowledging and objectively assessing the consequences of his behavior.

Additionally, experiencing inequity pushed people into a compensation-seeking mode at the price of losing further resources. Even more disturbingly, in this case compensation was even sought from a party unrelated to the unfair treatment as Study 4 demonstrated. Self-servingly formed beliefs about the relevant norms fueled this maladaptive behavior, again in protection of positive self-image.

Study 1 presented – to a best of my knowledge – the first academic investigation of interpersonal loans. The key interest was the presence and the role of self-serving bias in borrowers' and lenders' encoding and recalling of the loan episode, the self-serving potential of delinquent loans on the relationship and the incongruence between parties' interpretation and perspectives on the consequences of delinquency.

Although successfully completed interpersonal loans could build mutual trust over time, study 1 documents the negative potential of unpaid loans. Results showed that borrowers and lenders hold incongruent memories about the lending episode and the features of the loan situation. Specifically, borrowers displayed self-serving memories about the circumstances and some objective characteristics of the loans (such as their sizes and when they were made), indicating a strategic recall or forgetting of the uncomfortable loan episode. The fact that borrowers who failed to repay the loan by the agreed upon time were prone to report these loans as gifts (and also reported beliefs that they would eventually pay off the loans) indicates that they resorted to an egocentric reframing of the loan in order to avoid feeling guilt and shame. This

avoidance strategy was also found when it came to acknowledging and appreciating the consequences of unpaid loans on the lender.

These negative consequences were almost entirely driven by loans unpaid by the agreed-upon time. We argue that this sourness emerges because people, who trust in each other at first, erode this relationship because the borrower violates the implicit norm of repaying a loan as agreed. In this case, not only is the money lost (or at least temporarily unavailable) for the lender, but his trust is further abused. In other words, delinquency in loan repayment can create an asymmetric history between parties. Under these conditions we found a strikingly divergent perception of the consequences of the loan's delinquency on the parties. Due to the borrowers' self-serving behaviors, lenders might feel that his bad feelings are unacknowledged, which may further perpetuate the bad cycle.

Studies 2 and 3 were predominantly behaviorally focused. These experiments documented that bargaining parties sharing an asymmetric history are more likely to end up at a bargaining impasse than those with either unshared, asymmetric histories or shared, symmetric ones. The underlying cause was that the party who received the shorter end of the stick sought compensation and insisted on this – not just from anyone, but from the person who previously benefited at his expense.

Study 4 demonstrated that people hold eroded beliefs about the norm after experiencing inequity, which then drives their behavior to seek compensation from a third party. Studies on cheating and lying emphasize that people are reluctant to deviate too much from their beliefs about the normative behavior when cheating would otherwise pay off quite well. Another stream of studies find that people flexibly adjust their norms after financial deprivation which (they speculate) eliminates psychological costs of violating norms. These studies, however, do not incentivize beliefs elicitation and, hence, it is unclear if compromised beliefs are causes or effects of compromised behavior. Study 4 aimed to fill this gap by properly incentivizing the elicitation of beliefs about the relevant norms. At the same time, it specified the role of beliefs in compensation-seeking and negative reciprocity.

Our findings were in line with motivated reasoning, since compromised beliefs lead to compensation-seeking through under-compliance but they had no causal role in negative reciprocity. Another important finding was that people would seek compensation from a neutral third party after an unfair treatment. Furthermore, looking at the underlying mechanism of

indirect negative reciprocity (i.e., punishment), this study suggests beliefs have no causal effect here. In fact, carrying out punishment implied deviating from beliefs for the revenge-takers. Literature on deviating from believed norms suggests that punishment imposed some psychological cost on the actor.

Limitations

Ideally, in study 1, we could have employed a representative sample of lender-borrower pairs or a more representative sample of loans. At the same time, however, using this sample we were still able to detect the negative potential of interpersonal lending. Also, for loans that were paid off we should have asked if they were paid off on time. In addition, we could have pursued a more detailed analysis on the income differences between lenders and borrowers if we had asked for respondents' credit scores.

In studies 2 and 3, we should have elicited bargaining partners' notions on their fair share before they started bargaining. Distinguishing whether a selected fairness norm is truly self-serving or just egocentrically biased is important, as pointed out and demonstrated by Konow (2000) in a cleverly designed sequence of dictator games. The implication for bargaining behavior is clear: if a compensation claim is fueled by a self-serving view on entitlement, the party will not make a concession, even at the price of not reaching settlement and losing resources. This is because he truly believes that his selected fairness view (i.e., to be compensated) coincides with what is objectively fair. When the endorsed fairness view is only egocentrically biased, on the other hand, the party acknowledges that it is selfishly selected and is willing to compromise if settlement is in risk. This is an important distinction because this explains intransigence in negotiations even when insisting on one's claim leads to losing substantial resources (e.g., Babcock et al., 1995; Birkeland & Tungodden, 2014)

In addition, we have no way of telling if insistence upon compensation when disagreement is costly was driven only by loss repair or may have also included equity restoration. In this latter case, it is conceivable that the loser party wanted to punish the winner with his disagreement, since this could potentially decrease the winner's earnings.

In my view, the main limitation of study 4 is that we did not have a condition in which unfairness was due to nature (e.g., rolling a die). This could have allowed us to disentangle

whether intentions or just unfairness drove compensation-seeking behavior. Additionally, in order to have some kind of estimate of the cost of deviating from one's believed norms, we could have estimated a priori or experimentally elicited some measures of this. This could have allowed us to precisely address the nature of the punishment. Finally, having a payoff structure in which the maximizing strategy varies between risk-preferences could have enabled us to estimate whether compensation-seeking and punishment can push people to behave against their risk preferences.

Final comment

Findings presented in this dissertation demonstrate the malleability of the past and its potential to be adapted and reconstructed to serve one's present behavior. Another quote from Stella Adler is perhaps better suited to describe this role of the past in one's present actions:
„Don't use your conscious past. Use your creative imagination to create a past that belongs to your character. I don't want to you to be stuck with your own personal life. It's too little."

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Lenders' blind trust and borrowers' blind spots: A descriptive investigation of personal loans

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ABSTRACT

We surveyed 971 individuals about their experiences with personal loans. Beyond the objective characteristics of the loans (e.g., whether interest was charged), and the purpose of the loan, we tested – and found support for – two main predictions: (1) at recall and evaluation of loans would be subject to a self-serving bias such that borrowers would, for example, recall having paid back a larger proportion of the loan, and (2) that loans, and particularly those not paid off by the agreed upon date, would have pernicious effects on the personal relationship between lender and borrower. Furthermore, we found that borrowers have a blind spot when it comes to recognizing the negative feelings and perceptions evoked in lenders by delinquent loan repayment.

> Creditors have better memories than debtors.
> Benjamin Franklin

1. Introduction

With the advent of the so-called 'microfinance revolution' in developing countries, the topic of loans has received new scrutiny (e.g., Khandker, 2005). Research on microfinance has explored two main issues (Hermes & Lensink, 2007): The first focuses on the tradeoff between financial sustainability and outreach (e.g., Cull, Demirgüc-Kunt, & Morduch, 2007) with a vigorous debate centering on the question of whether or not to subsidize interest (so as to increase outreach) or offer loans at market rates that are more likely to bring numerous lenders into the market (e.g., Cull et al., 2007). The second, which is more closely relevant to personal loans, deals with the social, economic and psychological mechanisms that increase the likelihood of repayment, including social sanctions, peer monitoring and the mutual interdependence created by joint liabil-

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ity (e.g., Armendáriz de Aghion, 1999; Armendáriz de Aghion & Gollier, 2000; Besley & Coate, 1995; Chowdhury, 2005). Loans have also received new interest in the aftermath of the mortgage crisis, with research addressing such diverse topics as foreclosure (Whinston, 1990), prepayment (Stanton, 1995), predatory lending practices (e.g., Azmy, 2005; Willis, 2006), risk-ratings (Treacy & Carey, 2000), and misaligned incentives by both borrowers and lenders (e.g., Kupman, 2009; Tarr, 2010).

In contrast to the plethora of research dealing with microfinance, and with different facets of commercial loans, there is a category of loans that, although dating back throughout recorded human history and continuing to play a prominent role in contemporary human affairs, has received far less attention from academics: personal loans between individuals. Although the term 'reciprocal lending' has been coined for lending and borrowing between individuals (see, e.g., Morduch, 1998; Sharma & Dréze, 1996; Sinha & Matin, 1998), the characteristics, purposes and consequences of personal loans have not been widely and systematically investigated.

We present results from a detailed survey of personal loans. Beyond providing a broad description of personal loans, the characteristics of borrowers and lenders, and the relationships between them, we focus on two psychological issues: (1) whether the two parties to a loan are subject to self-serving bias when it comes to encoding and/or recalling different aspects of the loan, and (2) when and how loans affect the relationship and subsequent interactions between borrower and lender.

Beyond the obvious differences in the parties involved in personal (as compared with commercial and microfinance) loans, personal loans also differ on a number of other dimensions. With personal loans, in contrast to commercial loans, there is typically no written contract, interest is rarely paid or expected (although see Brandt & Hosios, 2010), and they are almost never collateralized. Given the absence of a formal contract, and the lack of collateral and intermediation, personal loans can be considered a kind of 'relational contract' (Baker, Gibbons, & Murphy, 2002; Brown, Falk, & Fehr, 2004; Brown and Serra-Garcia, 2010; Goetz & Scott, 1981; Gundlach, Achrol, & Mentzer, 1995; Sirdeshmukh, Singh, & Sabol, 2002; Tax, Brown, & Chandrashekaran, 1998; Williamson, 1975); they rely heavily on good will – trust – between the borrower and lender. This reliance on trust has both up-side and down-side potential.

In the best of circumstances – e.g., when the lender's sacrifice is duly appreciated by the borrower, and the loan is repaid in a timely fashion – loans can strengthen the relationship between lender and borrower. Prior research on group lending has found that the mutual interdependence of group members can improve relations between them (Feigenberg, Field, & Pande, 2010). Analogously, personal loans can have positive effects on the relationship between borrower and lender, both because (in the absence of coercion) it is clear that the lender is displaying generosity, and because, exactly due to the absence of a formal contract, it is equally obvious that a borrower who repays a loan could have, in most cases, defaulted without incurring negative material consequences.

The informality of personal loans, however, also introduces potential pitfalls. The fact that a loan has been made probably indicates the presence of trust between lender and borrower. But trust, by its very nature has the potential to be violated, potentially threatening the relationship that made the loan possible in the first place. This possibility is especially likely, we hypothesize, due to the operation of self-serving bias. In our survey, we test for self-serving bias in a variety of ways, looking for systematic differences between borrowers' and lenders' perceptions about, for example, whether loans have been repaid, and whether the loan really was a 'loan' or was perhaps really more of a 'gift'. Such divergences of perceptions and feelings could, potentially, plant the seeds of distrust and mutual hostility between lenders and borrowers, and damage the relationship between them. Beyond testing for self-serving bias, we also include items in the survey designed to test whether, if bias is present, people are aware of it. Prior research on the bias 'blindspot' (Pronin, Lin, & Ross, 2002) has found that people tend to not be aware of their own self-serving biases, and that such unawareness can further exacerbate misunderstandings.

For purposes of analysis and exposition, we classify loans into two broad categories: (1) 'asymmetric' loans between people, such as parents and children, who stand in different relation to one-another and (2) 'symmetric' loans between peers, including friends, coworkers, siblings and cousins. Pilot studies led us to the conclusion that asymmetric and symmetric loans are fundamentally different. Since a central focus of our research is on the impact of loans on relationships, and since parent–child, grandparent–grandchild relationships tend, at least ideally, to have solidity that other types of relationships may lack, we made the decision to limit our main analyses to symmetric loans.

This decision also reduces the dependence of the results on the characteristics of our non-representative sample. For example, since parents are much more likely to loan money to children, if we happened to sample a large number of older people who were parents, we would inevitably pick up a large number of people who recalled lending but not borrowing money, but this would not reflect any bias in recall but simply the demographics of our sample. This problem is reduced, although not eliminated, by focusing on symmetric loans. Given the size and relative diversity of the sample, however, we hope that the results reported provide, at minimum, an indication of the breadth of lending experiences, and the range of the consequences of loans for both lenders and borrowers.

2. Background literature

2.1. Prior literature on loans

The academic research most closely related to personal loans deals with P2P social lending in online communities such as *prosper.com* or *zopa.co.uk.* On these online platforms, borrowers advertise their projects, and lenders can choose borrowers to whom they wish to lend. Loans made online are not collateralized, and there is an inherent informational asymmetry between lenders and borrowers (Berger & Gleisner, 2009). Research on P2P online lending shows that lenders draw valid infer-

ences about borrowers' creditworthiness from factors such as credit grades, verified bank accounts, home ownership, debt to-income ratio and employment (Iyer, Khwaja, Luttmer, & Shue, 2009). However, nondiagnostic factors suggestive of bias, such as race, beauty, age and military involvement also influence lenders' decisions. Ravina (2008) found that, after controlling for information dealing directly with credit-worthiness, personal characteristics such as beauty, race and military involvement significantly affected the interest rates obtained by borrowers. Whites, and the more beautiful, received lower interest rates, despite the fact that, in Ravina's sample, they were not less likely to default than nonwhite and non-beautiful people. Pope and Sydnor (2011) also found that military involvement led to better loans, found that older age led to inferior loans, and, contrary to Ravina (2008) found that blacks were more likely to default than nonblack borrowers, that blacks received less favorable loan terms, but that the worse terms they received did not fully compensate for their greater risk of default.

As is also true of group lending, social ties have a beneficial effect in P2P lending. Some online borrowing communities offer borrowers the opportunity to join groups, similar to those on social network sites such as Facebook. Research examining this feature consistently finds that borrowers who join such groups receive lower interest loans (Berger & Gleisner, 2009; Ryan, Reuk, & Wang, 2007). Group membership may signal borrower's creditworthiness, given that group membership is often conditional on a good track record, and may improve borrowers' skills when it comes to getting a good loan; group members often provide advice to one-another. The existence and impact of group membership indicates that, as with personal loans, personal relationships and signals of trustworthiness play important role in online borrowing communities as well.

Research on microfinance is a second line of literature relevant to personal loans. As already noted, such research can be crudely categorized into two strands, one dealing with the tradeoff between financial sustainability and outreach, and the other dealing with social, economic, and psychological mechanisms that increase the likelihood of repayment.

Empirical studies in the second vein of research have identified factors and mechanisms that contribute to the creation or deterioration of social capital through joint liability. Wenner (1995) highlights the positive effect of having a formal written contract, Zeller (1998) finds that stronger social ties predict higher repayment and Wydick (1999) finds that dissemination of information about group members' income enhances repayment, while personal closeness of group members generally decreases the likelihood that the loan will be repaid.

While prior closeness between group members may decrease the probability of loan repayment, participation in lending groups generally tends to increase the strength of group bonds. Feigenberg et al. (2010), for instance, find that group lending facilitates social capital formation, not only through joint liability, but also through the increased frequency of interaction between parties. These social ties in turn facilitate cooperative behavior and decrease default risk. On the negative side, however, and reversing the causality, relationships may also deteriorate as a result of default (Karlan, 2007). Similar to the findings for P2P lending, trust plays a key role in the formation and success of lending groups. Field experiments have found that greater trust between group members leads to higher repayment rates (e.g., Abbink, Irlenbusch, & Renner, 2006; Cassar, Crowley, & Wydick, 2007; Giné, Jakiela, Karlan, & Morduch, 2010; Karlan, 2005). As will become apparent, trust also plays a prominent role in personal loans.

2.2. Psychological mechanisms

Although psychology certainly plays a role in commercial loans, its influence is deliberately muted by objective criteria, such as credit scores, and formal record-keeping, including contracts and, ideally, careful accounting. With personal loans, in contrast, there are a wide range of psychological mechanisms that can impact repayment and, in turn, the quality of subsequent quality of relationship between partners. These mechanisms involve subjective construction and representation of the lending situation, biased perception and attribution of one's own and the other's behavior and intentions, and feelings and perceptions (e.g., indebtedness, trust, anger, and anxiety) that arise from interactions between the two partners to the loan.

2.2.1. Self-serving (re) construction of the present and past

The term 'Egocentric bias' encompasses a variety of judgmental biases that include the tendency to believe (or at least report) that we are better than average on desirable behaviors and traits, less likely than others to experience negative life events such as bad mental and physical health or being a victim of a crime (e.g., Colvin, Block, & Funder, 1995; Perloff & Fetzer, 1986; Weinstein, 1982), and that what is beneficial for us is also what is objectively fair (Babcock & Loewenstein, 1997). Research in psychology has found that self-serving biases result from both 'motivational' mechanisms, such as the desire to see oneself in a positive light (e.g., Aronson, 1969; Collins, 1996; Greenwald, 1980; Taylor & Brown, 1988), and cognitive mechanisms such as the perfectly reasonable tendency to believe that good things that happen to us are the results of our own efforts (e.g., Nisbett & Ross, 1980; Ross & Sicoly, 1979).

For a survey of the type we ran here, in which people are asked to report on current and past personal experiences, egocentric biases pertaining to the encoding and recall of such personal experiences are particularly relevant. Diverse research in psychology shows that memory is highly reconstructive (e.g., Bartlett, 1932; Schacter, 2001). This reconstructive nature of memory has been demonstrated in a wide range of contexts: in autobiographical memory (e.g., Conway & Pleydell-Pearce, 2000), in eyewitness testimonies (e.g., Neisser, 1981), and in traumatic memories (e.g., Loftus & Davis, 2006; McNally, 2003).

The ample 'degrees of freedom' that the brain enjoys when it comes to the encoding and retrieval of memories provides fertile ground for the same types of self-serving biases that influence other types of judgments. Rather than retrieving exact copies of stored memory traces, reconstruction of the past is powerfully guided by current beliefs and desires, including the desire to perceive oneself in a positive light. People accomplish this goal in part by selectively recalling episodes from the past that cast them in a favorable light (e.g., Mischel, Ebbesen, & Zeiss, 1976; Pieters, Baumgartner, & Bagozzi, 2006; Ross & Sicoly, 1979; Sedikides & Green, 2004, 2009). Based on this flexibility of human memory, we expected borrowers and lenders to have incongruent recollection of who initiated the loan. Specifically, we predicted, and tested, whether borrowers would to be more likely than lenders to report that the lender initiated the loan.

2.2.2. Self-serving notions of fairness, ethics and moral behavior

People are prone to self-servingly believe that what is beneficial to them is also what is fair (e.g., Konow, 2000; Messick & Sentis, 1979), a bias that can impede settlement in negotiation, causing all parties to lose out (e.g., Babcock, Loewenstein, Issacharoff, & Camerer, 1995; Thompson & Loewenstein, 1992). Similarly, people tend to believe that they behave more fairly, or ethically, than others do (Banaji, Bazerman, & Chugh, 2003; Baumhart, 1968; Chugh, Bazerman, & Banaji, 2005; Messick, Bloom, Boldizar, & Samuelson, 1985). This 'bounded ethicality', as Bazerman and coauthors label it, affects not only recall and interpretation of the past (Shu, Gino, & Bazerman, 2011), but predictions of the future (Messick et al., 1985; Tenbrunsel, Diekmann, Wade-Benzoni, & Bazerman, 2010).

To measure self-serving perceptions of loans in our survey, we included items that asked whether the agreed-upon payment date had passed, and, inspired by Shu et al. (2011), whether parties to an unpaid-off loan anticipated that it would be paid off in the future. Based on prior findings, we anticipated that lenders would be more likely to believe that the agreed upon repayment date had passed, and that borrowers would be more optimistic about their own future likelihood of repaying the loan. We also included a wide range of other items designed to test for the operation of egocentric-biases, including a question about whether the loan had really been more of a 'gift', with the expectation that delinquent borrowers will be the most motivated to reframe the loan as having really been a gift, to maintain their positive self-image.

2.2.3. Self-serving behavior in exchanges of favors

Webster's defines a favor as "something done or granted out of goodwill, rather than from justice or of payment; a kind act." By this definition, a personal loan qualifies as a type of favor. The rich academic research on favors overlaps, in part, with the research on the self-serving reconstruction of memory. Research on favors has found that, immediately after providing a favor, favor-givers tend to denigrate their own generosity, while receivers of favors tend to be highly grateful (e.g., Flynn, 2003; McGuire, 2003). Over time, however, the favor recipient's appreciation tends to depreciate, while the favor-provider's estimation of his or her own generosity increases (Flynn, 2003), suggestive of a self-serving shift in perception. Burger, Horita, Kinoshita, Roberts, and Vera (1997) found that the norm of reciprocating a favor is time-sensitive: people feel less obliged to reciprocate as time passes. To examine each loan's evaluation and its change over time we included questions about the helpfulness of receiving or the sacrifice of making the loan. Additionally, by examining the connection between these two variables and the time when the loan was made, we were able to see whether a similar temporal pattern applies to borrowers' appreciation of and lenders' magnanimity toward loans.

Other research dealing with favors finds that providers and receivers of favors perceive different elements of the situation as salient, which also leads to differential evaluation of favors by their providers and receivers. Givers' assessments of a favor depend critically on how much aid was provided, while receivers' evaluations are more closely connected to how the favor was conferred (Flynn & Brockner, 2003). Receivers are especially appreciative if they perceive that the provider took steps intended to reduce the recipient's embarrassment (Flynn, 2003). Drawing on these findings, we asked respondents to recall the circumstances of the loan situation, with a special focus on the issue of who initiated the loan. Consistent, again, with a self-serving bias, we anticipated that borrowers would be more likely than lenders to recall that the loan had been initiated by the lender.

Finally, research on the receipt of help (i.e., favors) has found that the gratitude experienced by aid recipients improves psychological well-being (e.g., McCullough, Emmons, & Tsang, 2002), facilitates their own subsequent prosocial behavior (Bartlett & DeSteno, 2006; McCullough, Kilpatrick, Emmons, & Larson, 2001; Schaumberg & Flynn, 2009; Tsang, 2006), and generally improves the relationship between the giver and receiver (McCullogh et al., 2002). Based on these findings, we hypothesized that borrowers' gratitude would both signal and potentially increase the likelihood of their trustworthiness. Therefore, we hypothesized that the more helpful a borrower perceived the loan to be, the more likely he/she would be to pay it back according to the agreed-upon time line.

2.2.4. Blind spot in perceiving other's feelings and consequences of own behavior on other

'Blind spot' is a term used by social psychologists to describe people's tendency to judge themselves and their own behavior more positively than they judge others' behavior (e.g., Pronin, 2008). Specifically, people recognize and point out biases in others' behavior but fail to be similarly critical toward their own behavior (Pronin et al., 2002). People, for instance, believe that their motivations are more selfless than others' (e.g., Epley & Dunning, 2000; Miller & Ratner, 1998). Failing to recognize when their own behavior is unethical, people lack the information that would be required to make adjustments to that behavior (e.g., Bazerman & Tenbrunsel, 2011; Chugh & Bazerman, 2007).

One psychological mechanism that contributes to blind spots is 'naïve realism', the belief that we see the world objectively (e.g., Griffin & Ross, 1991) and that others see the world similarly to us (Ross, Greene, & House, 1977). Upon having this latter view disconfirmed – when we discover that another's view differs from ours – instead of reconsidering our own views, we assume that the other's view is unreasonable and biased (e.g., Kennedy & Pronin, 2008).

To examine the blind spot bias as it applies to personal loans, we included pairs of questions in which partners provided their own perspectives on different issues (e.g., about the change in closeness that had resulted from the loan) and also asked each party to guess how the other party would respond to the question (e.g. to judge the other party's change in closeness). These paired items enable us to go beyond simply examining self-serving encoding and reconstruction of memory, to examine whether borrowers and lenders are aware of the gap between their own and the other party's feelings and attitudes. Our prediction, based upon the blind-spot literature, was that both borrowers and lenders would not only display bias in judging their own behavior, but would also assume that their biased perspective was shared by the other party to the loan.

2.2.5. Trust

Trust is a key factor in economic prosperity (e.g., Arrow, 1972; Fukuyama, 1995) and as noted earlier, trust plays a key role in social capital formation and successful borrowing. Unquestionably, lenders' trust and borrowers' trustworthiness is crucial when there are no means of enforcing payback. Identifying factors that predict trust and trustworthiness are a focus of considerable research in psychology (e.g., Mayer, Davis, & Schoorman, 1995; Rotter, 1967, 1980) and in economics (e.g., Alesina & La Ferrara, 2002; Ben-Ner & Halldorsson, 2010; Glaeser, Laibson, Scheinkman, & Soutter, 2000; Kugler, Bornstein, Kocher, & Sutter, 2007; Rousseau, Sitkin, Burt, & Camerer, 1998). Glaeser et al. (2000), for example, combined survey and experimental methods to measure trust and trustworthiness and to identify their predictors. They find that an individual's own trustworthiness is predicted by how much the individual generally trusts others. Additionally, greater social connectedness predicted higher levels of trustworthiness, but did not predict trust.

To investigate how the outcome of the lending interaction impacts lenders' trust and willingness to lend to borrowers again, we included a question about the change in the lender's trust as a result of the loan (self-report for lenders and an assessment of lenders, for borrowers), and a question about the willingness to engage in a subsequent lending interaction with the focal partner. Unsurprisingly, we anticipated that loan delinquency would result in a decrease of lenders' trust in borrowers, and a decrease in self-assessed likelihood of making another loan to the same borrower in the future.

3. Methods

The survey, which was fielded in 2011, recruited respondents from the Amazon.com service MTurk. Amazon MTurk is a marketplace on which people register to complete diverse types of computer-based tasks, including completing surveys, in exchange for remuneration. If the task is completed and the requester accepts the completion, the worker gets paid. Requests for work on MTurk describe the nature of the task, the time it should take to complete, and the remuneration (see https://www.mturk.com/mturk/help?helpPage=overview). Respondents, screened to be American citizens currently living in the US, received $0.50 for completing the survey. A total of 1036 individuals began the survey; however 52 (5.02%) were excluded because the loan they reported on was from a bank or other financial institution (i.e., was not a personal loan) or for having made the loan before the stipulated 5 year time limit, and 13 (1.25%) were excluded because they discontinued the survey prior to providing demographic information. Thus, the final survey included 971 valid respondents. Detailed demographics can be found in Table A1 of the on-line appendix available at (http://dx.doi.org/10.1016/j.joep.2012.06.002) Table A1 reveals that symmetric loans were made between borrowers and lenders who were similar in demographic characteristics, including age in years (lenders' mean = 32.0, SD = 11.1 and borrowers' mean = 31.4, SD = 10.8), gender (both groups approximately 61% female), racial composition and education. There were slightly more borrowers than lenders in the lowest income strata (11.9% lenders versus 17.7% borrowers) and slightly more part-time employed people than full employed among borrowers than lenders.

The survey, which was administered on Qualtrics and included informed consent, took an average of about 20 min to complete. LINK TO SURVEY OMITTED FROM REVIEW COPY DUE TO IDENTIFIABILITY Respondents were randomly assigned to one of two surveys that varied only in whether it asked first about a situation in which the respondent had loaned money then a situation in which they had borrowed money, or vice versa. Participants in the lending-first condition who reported no lending episodes were then directed to the questions about borrowing, and vice versa. Individuals who reported neither a lending nor a borrowing episode were directed to the demographic questions.

In each case, participants were asked about *the most recent loan they had been involved within the past 5 years*. The lending and borrowing sections of the survey contained equivalent questions. For example, in the lending survey, respondents were asked "To whom did you lend the money?" whereas in the borrowing phase, respondents were asked "Who gave you the loan?"

Within each phase (lending and borrowing), survey items included two categories of questions that were spread throughout the survey and administered. The first elicited information about the characteristics of the loan, such as its size, how much had been paid back, when the loan was made, the presence of interest, the existence of a formal contract (e.g., 'IOU'), the purpose of the loan, and a brief description of the lending situation, as well as subjective questions about the degree to which the loan was helpful to the borrower (asked of both borrow and lender), and the degree of sacrifice it entailed to the lender (also elicited from both parties). Additionally, for unpaid loans respondents were asked whether they believe

that the loan would ever be paid back. Finally, the survey asked about specific affective states associated with the loan such as feeling happy, angry, guilty, relieved, upset, anxious, and losing sleep.

The second category included questions about the relationship between the borrower and lender and the history of interactions between them. Survey items included the other person's age, the duration of the relationship, and details of past borrowing and lending activity between the parties, questions about their feelings of closeness towards the partner both at present and prior to the loan, and respondents' perceptions of their loan-partner's current and prior feelings of closeness to them. We also asked both parties whether they avoided encounters with the other party and whether they believed the other party avoided encounters with them, whether they would be willing to be involved in borrowing or lending to the other party again, and, for unpaid loans, how often the lender reminded the borrower of the need to pay back the loan. Finally, we asked lenders whether their trust in their borrowers had changed as a consequence of the loan, and asked borrowers about whether the lender's trust in them had changed.

4. Results

4.1. Characteristics of the loans

Across both orders (borrowing then lending and lending then borrowing), 21.6% ($n = 210$) of respondents reported an episode of lending but not borrowing in the last 5 years, 24.6% ($n = 239$) reported borrowing but not lending, 22% ($n = 214$) reported both borrowing and lending, and 31.7% reported having neither borrowed nor lent.

Table 1 provides a breakdown of the relationship between borrowers and lenders, both for all loans (left columns) and for symmetric loans only (right columns). In this and most subsequent tables, results are presented by lending episode rather than by respondent, so that respondents who both borrow and lend appear twice, and those who neither borrowed nor lent do not appear at all.

The *n*'s in the headings of Table 1 show that all loans are more likely to be reported by borrowers than lenders (28.3% of asymmetric loans are reported to be lending, probably because most asymmetric loans are from parents to children and MTurk respondents are on average young, and thus mostly borrowers), whereas symmetric loans are more likely to be episodes of lending (55.2% of symmetric loans are reported to be lending). *All subsequent analyses in the paper are restricted to the symmetric loans that are shown in the right two columns.*

Perhaps the simplest test of the self-serving bias is whether there is a difference in memory for lending versus borrowing. To the degree that lending is seen as more socially desirable than borrowing, due to self-serving bias we would predict that people should have a more accurate memory of loans they gave than those they received. Consistent with this prediction, once we restrict the set of loans in a fashion as detailed above (that is, excluding asymmetric loans), the ratio of borrowing and lending is skewed; 55.2% of recalled loans are episodes of lending, whereas only 44.8% of recalled loans are episodes of borrowing, a significant difference ($\chi^2(1) = 7.46$, $p \leqslant .001$). Table 2 not only documents this asymmetry, but also hints an explanation for it. When we look at individuals who were asked about borrowing first, there is a perfect equivalence to the incidence of reported borrowing and lending. When people reported an episode of borrowing, it seems, they were motivated to recall and report an episode of lending. However, when people first reported an episode of lending, they seem to have been far less motivated to recall and/or report an episode of borrowing. Perhaps they rationalized to themselves that they had already put enough time or effort into answering the prior questions on the survey.

Table 1
With whom was the loan made?.

	All loans		Symmetric loans	
	Lend ($n = 424$) (%)	Borrow ($n = 453$) (%)	Lend ($n = 361$) (%)	Borrow ($n = 293$) (%)
Parent	7.1	29.6		
Child	6.8	2.2		
Grandchild	.0	.4		
Relative (including spouses, in laws)	4.5	6.6		
Sibling	19.6	11.1	23.0	20.5
Friend	43.2	29.1	50.7	45.1
Significant other (boyfriend/girlfriend not a spouse)	6.8	9.1	8.0	14.0
Co-worker	6.4	4.2	7.5	6.5
Fellow student	.7	.9	.8	1.4
Neighbor	1.2	.7	1.4	1.0
Acquaintance	2.1	2.2	2.5	3.4
Relative (not mother/father in laws, not stepchildren or stepparents)	0.0	0.0	4.2	5.8
Other	1.7	1.8	1.9	2.4
Total	100	100	100	100

Table 2
Frequencies of recalled lending and borrowing episodes within the two orders.

	Lend (n = 361) (%)	Borrow (n = 293) (%)	Total (n = 654)
Lend first	61.10	38.90	100% (n = 293)
Borrow first	50.40	49.60	100% (n = 361)
Total	55.2	44.8	100%

Table A2, further, provides a breakdown of different loan purposes reported by lenders and borrowers. As evident from this table lenders and borrowers report similar frequencies of loan purposes. The only exception is that borrowers are more likely to report borrowing for educational purposes ($\chi^2(27) = 39.12$, $p \leqslant .01$).

Table 3 summarizes a number of features of the loans recalled by borrowers and lenders. As is evident from the first rows of the table, lenders recall loans from earlier periods than borrowers. One possible account of this discrepancy is that lenders, in effect, have longer memories for loans than borrowers; or, stated differently, that borrowers are more likely to forget the loans they received than lenders are to forget the loans they gave. This account receives some support from Fig. 1, which shows that lenders and borrowers recall similar loans from the past month (when it seems unlikely that loans would be forgotten), but that people are less likely to recall borrowing than they are to recall lending as the temporal distance from the loan increases. In fact, 56% of all loans reported by lenders – but only 44% of loans reported by borrowers – were made more than a month ago ($Z = 2.85$, $p \leqslant .05$). Also consistent with the self-serving forgetting of loans that one has received is the second cluster of rows, which show that borrowers report larger loan sizes than lenders. This would be consistent with self-serving forgetting if a loan has to be larger for a borrower to recall it than for a lender to recall it.

The second cluster of rows indicates that lenders and borrowers have concordant memories about whether there was an IOU, an expectation that interest would be paid, and agreement upon the fashion of repayment. However, again consistent with self-serving encoding and/or recall, borrowers are less likely to report that the repayment date was agreed upon.

The fourth, fifth and the sixth cluster of rows include responses to questions dealing with the lending situation. Consistent with a self-serving bias, borrowers are more likely than lenders to report that the loan was initiated by the lender (cluster 4). Less interestingly (and not obviously related to the issue of self-serving bias), the results reported in cluster 5 indicate that lenders and borrowers have concordant memories about borrowers' behavior and feelings at the origination of the loan: both

Table 3
Simple characteristics of the loans, the lender-borrower relationship and the loan situation.

		Lend (n = 361)	Borrow (n = 293)	Total (n = 654)	Tests of significance of differences between lend and borrow
(1) Timing and size of loan					
Time passed (months) since the loan was made	Mean (SD)	14.14 (14.70)	11.94 (13.18)	13.16 (14.07)	$W(1,652) = 3.98^{**}$
	Median	9.00	6.00	8.00	$\chi^2(1) = 3.69^{*}$
Size of the loan (USD)	Mean (SD)	1089.31 (3420.18)	1743.67 (5771.72)	1382.37 (4635.64)	$W(1,652) = 3.24^{*}$
	Median	250.00	250.00	250.00	$\chi^2(1) = .40$
(2) Features of the agreement					
IOU		8.6%	7.2%	8.0%	$\chi^2(1) = .47$
Interest		3.0%	3.8%	3.4%	$\chi^2(1) = 2.50$
Agreement on when to repay		43.3%	37.1%	39.9%	$\chi^2(1) = 2.61^{*}$
Agreement on how to repay		41.0%	40.4%	40.7%	$\chi^2(1) = .02$
(4) Who initiated the loan...					
Not mentioned		46.3%	37.5%	42.4%	$\chi^2(2) = 15.54^{***}$
Lender initiated		14.7%	27.0%	20.2%	
Borrower initiated		39.1%	35.5%	37.5%	
(5) Borrowers' behavior and feelings at the origination of the loan (Lender's assessment, Borrower's self-report)					
Relaxed and comfortable		39.9%	35.2%	37.8%	MWU = 50868.00
Somewhat embarrassed and uncomfortable		33.2%	37.2%	35.0%	
Moderately embarrassed and uncomfortable		17.2%	18.1%	12.8%	
Extremely embarrassed and uncomfortable		9.7%	9.6%	9.6%	
(6) Pressure on lender to make the loan (Lender's self-report, Borrower's assessment)					
Not at all		60.4%	73.7%	66.4%	MWU = 42250.00***
Somewhat pressured		28.8%	21.8%	25.7%	
Quite pressured		7.8%	3.4%	5.8%	
Extremely pressured		3.0%	1.0%	1.5%	

* $p \leqslant .1$.
** $p \leqslant .05$.
*** $p \leqslant .001$.

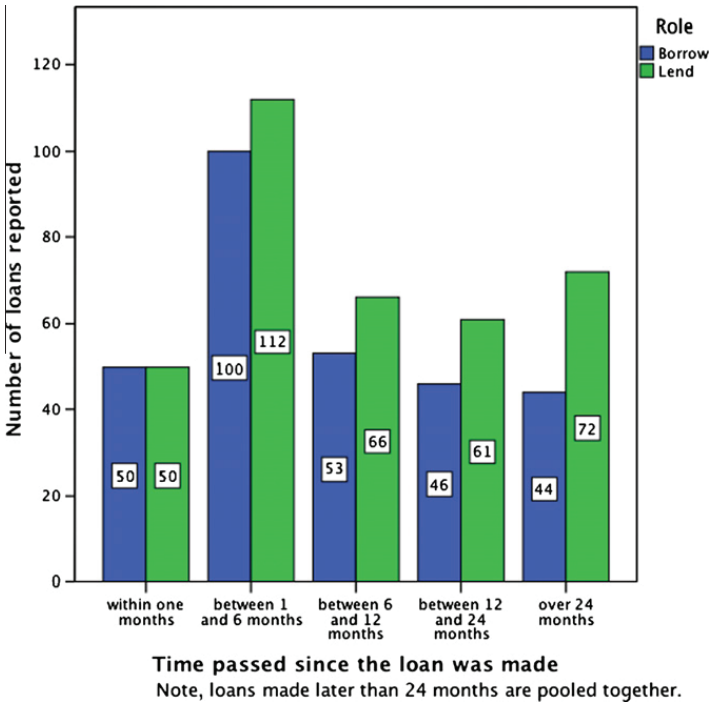

Fig. 1. The number of reported loans by lenders and borrowers as a function of time.

agree that borrowers were not particularly embarrassed about accepting the loan. However, in contrast, responses to the question of how pressured lenders felt to make the loan, summarized in cluster 6, indicate that borrowers fail to correctly perceive how much lenders report having felt pressured into making the loan. This discrepancy between the self-reported feelings of lenders, and the perception of those feelings on the part of borrowers, is the first indication of the borrower's 'blind spot' referred to in the title.

In sum, the results presented in this section suggest that lenders and borrowers have roughly concordant memories of factual terms of the loan – such as presence of IOU, interest, and agreement upon the expected terms of repayment. However, there is suggestive evidence that borrowers display self-serving behavior by not recalling loans made earlier in time and by being less likely to recall the presence of an agreed repayment date. Additionally, borrowers seem to have a biased memory of the lending situation, reporting that the lenders more often initiated the loans, and under-appreciating the pressure that lenders report having felt to make the loan. Lenders, in contrast, display a correct appreciation of the borrowers' feelings and emotions when making the loan.

4.1.1. Loan status

Table 4 presents a breakdown of loans according to whether the repayment date was reported to have passed and the loan paid off. In what follows, we refer to paid loans with passed repayment date as 'completed loans'. Unfortunately, we neglected to ask whether or not these loans were paid on time. Paid loans with an unpassed repayment date are labeled as 'diligent loans'. Unpaid loans with unpassed repayment date are labeled as 'in process loans'. Finally, unpaid loans with passed repayment date are labeled as 'delinquent loans'. Further investigation of self-serving behaviors, feelings associated

Table 4
Frequencies of different loan statuses for lenders and borrowers.

	Lend ($n = 361$) (%)	Borrow ($n = 293$) (%)	Tests of significance of differences between lend and borrow
Repayment date passed	48.8	41.0	χ^2 (1) = 3.97**
Unpaid	36.6	27.6	χ^2 (1) = 5.86**
Completed loans	33.0	35.8	χ^2 (1) = .59
Diligent loans	30.5	36.5	χ^2 (1) = 2.67
In process loans	20.8	22.5	χ^2 (1) = .29
Delinquent loans	15.8	5.1	χ^2 (1) = 18.79***
Total	100.0	100.0	

* $p \leqslant .1$.
** $p \leqslant .05$.
*** $p \leqslant .001$.

with the loans, and subsequent interactions and changes in lender-borrower relationships (next section) will take account of these four loan statuses.

From the first row of Table 4, we can see that borrowers are less likely to report that the repayment date is passed. The second row shows that regardless of whether or not the payment date has passed, borrowers are also less likely to report that the loan is unpaid. The third, fourth and fifth rows show that the two parties have concordant memories for the occurrence of completed, diligent and in process loans. The sixth row shows, however, that borrowers report far fewer delinquent loans than lenders do. Given the parties' concordance on other loan statuses, this pattern suggests that either lenders exaggerate the frequency of delinquent loans, or borrowers underestimate this frequency. Intuitively, we believe that the latter is more likely.

Table 5 presents the reported paid-back ratios of loans, both as reported by borrowers and lenders using a slider scale that went from 0% to 100% (left side of table) and computationally, by dividing the paid-back amount by the total loan amount (right side of table). The first row of the table shows that, for all loans, borrowers report a higher computed pay back ratio (that is, the proportion paid back of the total loan) than lenders report. The second row shows that, for unpassed-date loans, lenders and borrowers report and recall the same proportion paid back. However, for loans for which the repayment date has passed, borrowers report and recall having paid back a greater proportion of the loan than lenders report having received. Note, that this comparison, which is consistent with a self-serving bias, is conservative, since borrowers are already less likely to believe that the repayment date has passed.

Table 6 provides evidence of two further self-serving behaviors on the part of borrowers. First, they are more likely than lenders to reframe delinquent loans as 'gift' rather than a loan. Again, note that the comparison is conservative in the sense that many such 'gifts' probably were not caught by the survey if borrowers did not treat them as loans at the outset of the survey. Second, for in process and delinquent loans, borrowers are more likely to report that the loan *will* be paid back at some point than lenders are. Again, note that these differences are not only significant, but also come on the top of the difference between lenders and borrowers about whether the loan is repaid and in whether the loan is delinquent.

4.2. Feelings about the loan

In this section we review lenders' and borrowers' feelings associated with the loans. Our main prediction was that lenders, in general, would have more negative feelings about loans than borrowers. However, analysis of the data suggests more specifically that the greatest discrepancies between borrowers and lenders occur for delinquent loans.

Table 5
Mean (SD) Computed and Reported paid back percentages across lenders and borrowers for different loan statuses.

	Reported paid back percentage			Computed paid back percentage		
	Lend	Borrow	Tests of significance of differences between lend and borrow	Lend	Borrow	Tests of significance of differences between lend and borrow
All ($n = 654$)	67.13% (43.08)	72.39% (40.20)	$F(1,652) = 2.57$	66.94% (43.90)	73.38% (54.16)	$F(1,652) = 2.82^{*}$
Unpassed repayment date, ($n = 358$)	58.08% (43.86)	57.82% (43.16)	$F(1,356) = .00$	57.88% (44.98)	56.72% (44.35)	$F(1,356) = .06$
Passed repayment date, ($n = 296$)	76.62% (40.22)	93.41% (22.77)	$F(1,294) = 17.14^{***}$	76.48% (40.74)	97.41% (58.04)	$F(1,294) = 13.31^{***}$

* $p \leqslant .1$.
$^{**}p \leqslant .05$.
*** $p \leqslant .001$.

Table 6
Self-serving reframing (the loan was a gift) and self-serving reassurance (loan will be eventually paid off) for different loan statuses.

The loan...	Loan status	Lend	Borrow	Tests of significance of differences between lend and borrow
Was a gift	In process loans ($n = 141$)	28.0%	25.8%	$\chi^2(1) = .09$
	Delinquent loans ($n = 72$)	5.3%	20.0%	$\chi^2(1) = 3.38^{*}$
Will eventually be paid off	In process loans ($n = 141$)	52.0%	84.4%	$\chi^2(1) = 17.23^{***}$
	Delinquent loans ($n = 72$)	35.1%	86.7%	$\chi^2(1) = 12.73^{***}$

* $p \leqslant .1$.
$^{**}p \leqslant .05$.
*** $p \leqslant .001$.

Table 7
Regressions explaining perceived helpfulness of, and sacrifice entailed by, loan.

	Helpfulness for borrower		Sacrifice for lender	
	I.	II.	I.	II.
Lend (Lender = 1)	−.24** (.08)	−.24 (.18)	.32*** (.07)	.13 (.17)
Size	.22*** (.05)	.22*** (.05)	.23*** (.05)	.23*** (.05)
Time passed	−.02 (.03)	−.02 (.05)	−.00 (.03)	−.04 (.04)
Lend × Time passed		−.00 (.06)		−.07 (.06)
Constant	3.85*** (.14)	3.85*** (.14)	1.25 (.13)	1.36*** (.15)
F statistics	$F(3,650) = 9.53^{***}$	$F(4,649) = 7.14^{**}$	$F(3,650) = 14.82^{***}$	$F(4,649) = 11.52^{***}$
R^2	.04	.02	.06	.07

* $p \leqslant .1$.
** $p \leqslant .05$.
*** $p \leqslant .001$.

Table 8
Lenders and borrowers mean (SD) feelings associated with different loan statuses.

	N	Happy	Angry	Guilty	Relieved	Upset	Anxious	Losing sleep
All lenders	361	3.18 (1.21)	2.14 (1.30)	1.65 (1.04)	2.48 (1.28)	2.04 (1.24)	1.94 (1.23)	1.47 (.95)
All borrowers	293	3.18 (1.10)	1.86 (1.06)	2.55 (1.58)	3.33 (1.28)	1.98 (1.07)	2.13 (1.28)	1.06 (.06)
Test of significance of differences between groups	$F(1,652) =$	0.01	8.86	76.25***	71.93***	0.33	4.05	4.50
Diligent lenders	110	3.68 (1.06)	1.72 (1.01)	1.40 (0.74)	2.64 (1.30)	1.55 (0.84)	1.53 (0.94)	1.32 (0.83)
Diligent borrowers	107	3.30 (1.07)	1.79 (1.09)	2.32 (1.52)	3.72 (1.09)	1.88 (1.04)	2.09 (1.27)	1.66 (1.07)
Test of significance of differences between groups	$F(1,215) =$	6.93***	0.29	32.14***	44.28***	6.36	14.13***	7.03
Completed lenders	119	3.61 (0.93)	1.66 (0.90)	1.59 (0.92)	2.80 (1.25)	1.61 (0.90)	1.66 (0.99)	1.29 (0.69)
Completed borrowers	105	3.44 (0.99)	1.68 (0.89)	2.16 (1.47)	3.21 (1.38)	1.73 (0.93)	1.77 (1.14)	1.41 (0.93)
Test of significance of differences between groups	$F(1,222) =$	1.87	0.01	12.46***	5.47	1.1	0.66	1.13
In process lenders	75	2.84 (1.05)	2.33 (1.26)	1.92 (1.25)	2.31 (1.20)	2.29 (1.27)	2.15 (1.26)	1.56 (0.96)
In process borrowers	66	2.65 (1.11)	2.21 (1.21)	3.30 (1.55)	2.92 (1.24)	2.44 (1.10)	2.65 (1.31)	1.73 (1.05)
Test of significance of differences between groups	$F(1,139) =$	1.06	0.34	34.38***	9.01	0.53	5.45	0.98
Delinquent lenders	57	1.8 (1.81)	3.7 (1.32)	1.91 (1.30)	1.75 (1.11)	3.53 (1.23)	3.07 (1.41)	2.02 (1.32)
Delinquent borrowers	15	2.8 (1.01)	2.06 (1.03)	3.6 (1.35)	3.27 (1.28)	2.47 (1.36)	2.8 (1.26)	2.67 (1.45)
Test of significance of differences between groups	$F(1,70) =$	11.50**	16.96***	19.71***	20.78***	8.49	0.45	2.77
Nondelinquent lenders	304	3.45 (1.07)	1.85 (1.07)	1.6 (.98)	2.62 (1.26)	1.76 (1.03)	1.73 (1.07)	1.36 (.82)
Nondelinquent borrowers	278	3.2 (1.09)	1.85 (1.07)	2.49 (1.57)	3.39 (1.28)	1.96 (1.05)	2.01 (1.26)	1.58 (1.01)
Test of significance of differences between groups	$F(1,580)=$	7.74	0.00	68.60***	46.51***	5.38	14.84***	7.86

Bonferroni-corrected *p*-value.
Feelings were measured on a five level Likert scale: 1 – strongly disagree, 2 – disagree, 3 – neither disagree, not agree, 4 – agree, 5 – strongly agree.
*** $p \leqslant .001$.

We begin with an examination of lenders' and borrowers' perceptions of the burdensomeness of making the loan for the lender, and the helpfulness of the loan for the borrower. We predicted a self-serving bias on both of these dimensions – i.e., that lenders would perceive the loan as more burdensome for them to make than borrowers would estimate it to have been, and also that lenders would perceive the loan to have been more helpful to the borrower than borrowers did.

The first of these predictions was borne out; lenders perceive the loan as more burdensome (Mean = 2.12, SD = .99) than borrowers (Mean = 1.79, SD = .87), $F(1,652) = 18.41$, $p \leqslant .001$. This is true, as can be seen from Table 7, even after controlling for loan size and time passed. However, the second prediction was not supported; indeed the opposite was true; borrowers perceive the loan as more helpful (Mean = 4.32, SD = .91) than lenders (Mean = 4.07, SD = 1.07), $F(1,652) = 10.08$, $p \leqslant .05$.

In addition to asking borrowers and lenders about perceived burdensomeness of making, and helpfulness of receiving the loan, we also asked them to report on the feelings they experienced in connection with the loan (asking specifically about the degree to which the loan made them feel happy, angry, guilty, relieved, upset and anxious) and whether the loan had caused them to lose sleep. Table 8 provides a detailed breakdown of these feelings, by both loan status and role (borrower/lender).

As is evident from Table 8, regardless of loan status borrowers feel guiltier and more relieved than lenders. Diligent lenders feel happier than diligent borrowers; and diligent borrowers feel more relieved, guiltier, and more anxious than diligent lenders. Thus, it seems that even loans paid back in a diligent fashion can engender negative feelings such as guilt and anxiety for borrowers, beyond positive feelings of relief. For completed and in process loans the only difference between the parties is that borrowers report feeling guiltier than lenders.

The main differences in feelings between borrowers and lenders occur in connection with delinquent loans. As can be seen in Table 8 and depicted in Fig. A1, delinquent borrowers are much more likely to report feeling guilty, and also, strangely, relieved and happy. Lenders associated with delinquent loans, in contrast, are much more likely to report feeling angry. In sum, and consistent with Shakespeare's warning, getting involved in an loan, but especially one that is not paid off as agreed, engenders diverse negative feelings in both parties.

Why should lenders and borrowers react so differently to delinquency? Table 6 provides a potential clue. That table showed that for delinquent loans, borrowers and lenders have radically different perceptions of whether the loan will ultimately be paid off – 87% of borrowers think it will be, but only 35% of lenders. Perhaps partly as a result of this difference in expectations, loan delinquency engenders far more negative feelings in lenders. As we show in the next section, these negative feelings also have negative consequences for the relationship between the parties.

4.3. Consequences for relationship between lenders and borrowers

This section examines the impact of loans on relationships between borrowers and lenders, in the process examining how well each of the parties is able to appreciate the other person's feelings and behavior.

Table 9 summarizes a range of relationship variables. The top set of rows shows that, regardless of loan status, lenders report less closeness, greater decrease in closeness and greater decrease in their trust than borrowers. However, sub-anal-

Table 9
Mean (SD) current closeness, change in own and in other's closeness and lender's trust.

	N	Current closeness	Change in own closeness	Change in other's closeness	Lender's trust
All lenders	361	3.40 (1.38)	2.98 (0.87)	3.11 (0.91)	0.09 (0.66)
All borrowers	293	3.77 (1.22)	3.33 (0.74)	3.27 (0.73)	0.33 (0.53)
Test of significance of differences between groups	$F(1,652) =$	12.38***	29.44***	5.75	25.81***
In process lenders	75	3.52 (1.49)	2.91 (0.68)	2.95 (0.80)	−0.15 (0.54)
In process borrowers	66	3.68 (1.25)	3.18 (0.76)	3.06 (0.86)	0.15 (0.47)
Test of significance of differences between groups	$F(1,139) =$	0.48	5.12	0.66	12.09***
Delinquent lenders	57	1.98 (1.22)	1.96 (0.91)	2.32 (1.04)	−0.58 (0.60)
Delinquent borrowers	15	3.4 (1.29)	3.13 (0.99)	3.07 (0.80)	0.00 (0.65)
Test of significance of differences between groups	$F(1,70) =$	15.67***	19.02***	6.77	10.76***

Bonferroni corrected p-values.
Scale of Current closeness: 1 – not at all, 3 – neither, 5 – very close; Change in closeness: 1 – much less, 3 – no change, 5 – much closer and Lender's trust: −1 – decreased, 0 – no change, 1 – increased.
*** $p \leqslant .002$.

yses comparing different loan statuses show that almost the entire effect is driven, again, by the feelings of delinquent lenders. Lenders in situations other than delinquency, and borrowers in all situations, have stable attitudes toward, and views of, the relationship. Lenders on loans that become delinquent report lower levels of current closeness and a greater decline in closeness. This table also shows that in process lenders report a greater decrease in trust than borrowers assume their lenders have experienced. Furthermore, delinquent lenders report feeling less close, as well as a greater decrease in closeness and trust, than delinquent borrowers do.

Table 9 also presents lenders' decrease in feeling of closeness, both as self-reported by lenders, and as assessed by borrowers. For delinquent loans, borrowers under-appreciate the decrease in lenders' closeness ($F(1,70) = 183.9$, $p \leqslant .001$). At the same time however for delinquent loans lenders' overestimate decrease in borrowers' closeness, $F(1,70) = 7.50$, $p \leqslant .05$). Perhaps lenders are incorrectly projecting their reduced closeness on borrowers. This pattern is depicted in Figs. A2 and A3 showing the discrepancy between self-report and assessment for delinquent lenders and borrowers.

The last column of Table 9 compares borrowers' perceptions of change in lenders' trust in them to lenders' self-reported change in trust toward the borrower. As evident from this table, and depicted graphically in Fig. A4, borrowers are able to correctly appreciate change in lenders' trust for all loan statuses except in process and delinquent loans. It seems that in these two cases borrowers under-appreciate how much lender's trust decreased as a result of the loan.

Table 10 compares lenders' and borrowers' perceptions of how the loan affected a variety of specific aspects of the relationship: (1) how often the lender reminded the borrower of the need to repay, (2) whether the borrower avoids encounters with the lender, and (3) whether each party would be willing to enter into a loan with the other in the future.

Responses to the question about lenders' reminders of borrowers' need to pay back loans are the most surprising and subtle of the three items. On the one hand, one might think that such reminders would be especially bothersome to borrowers, and hence that borrowers would be more likely to recall them. On the other hand, lenders might frequently contemplate delivering such reminders, but find it uncomfortable to do so. Each time they do surmount their trepidation, however, they may try to deliver the message with great subtlety in order to be tactful. As a result, these episodes could be highly salient to lenders, who must overcome their discomfort, but not particularly uncomfortable to borrowers, who receive a diluted form of the message that lenders would really like to deliver. As it turns out the data strongly support the latter account. Lenders of both in process and (especially) delinquent loans, as evident from Table 10, are more likely to report reminding the borrower of the need for repayment than borrowers recall having been reminded.

When it comes to perceptions of the borrower's attempt to avoid encounters with the lender, perhaps not surprisingly, both parties report a greater likelihood of avoidance for in process and delinquent loans. Parties are fairly consistent in the former case. However, for delinquent loans lenders are far more likely to believe that borrowers are avoiding them than borrowers self-report themselves as doing so. Additionally, lenders report an increase of borrowers' avoidance from in process to delinquent loans (20% versus 63.2%). Again, there is a huge gulf in perceptions between borrowers and lenders for delinquent loans.

Finally, a very similar pattern emerges for whether the parties report willingness to engage in a loan with the other party again in the future. Borrowers are most ready to borrow again from lenders of completed and diligent loans, and are somewhat less likely to be ready to borrow again when loans are in process or delinquent. Lenders are very ready to lend again to

Table 10
Consequential interactions between lenders and borrowers for different loan statuses.

(1) Remind the borrower of the need of paying back[a]	Lend	Borrow	Test of significance of differences between lend and borrow
In process loans ($n = 141$)	48.0%	28.8%	$\chi^2(1) = 5.47^{**}$
Delinquent loans ($n = 72$)	71.9%	20.0%	$\chi^2(1) = 13.48^{***}$
(2) Borrower avoiding encounters with lender (lender's assessment, borrower's self-report)[b]			
Complete loans, ($n = 224$)	7.6%	2.9%	$\chi^2(1) = 2.44$
Diligent loans ($n = 217$)	2.7%	1.9%	$\chi^2(1) = .18$
In process loans ($n = 141$)	20.0%	22.7%	$\chi^2(1) = .16$
Delinquent loans ($n = 72$)	63.2%	26.7%	$\chi^2(1) = 6.40^{**}$
(3) Make a loan with the person again?[c]			
Completed loans ($n = 224$)	89.9%	93.3%	$\chi^2(1) = .84$
Diligent loans ($n = 217$)	93.6%	87.9%	$\chi^2(1) = 2.17$
In process loans ($n = 141$)	66.7%	81.8%	$\chi^2(1) = 4.16^{*}$
Delinquent loans ($n = 72$)	26.3%	73.3%	$\chi^2(1) = 11.38^{**}$

* $p \leqslant .1$.
** $p \leqslant .05$.
*** $p \leqslant .001$.

[a] The four-level response scale (1 – never, 2 – occasionally, 3 – frequently, 4 – to the point of harassment) was collapsed to two levels (Yes or No). Yes included occasionally, frequently and to the point of harassment and No included never.

[b] The four-level response scale (1 – s/he is not avoiding encounters or contact with me at all, 2 – s/he somewhat avoids encounters or contact with me, 3 – s/he very much avoids encounters or contact with me, 4 – s/he no longer as any contact with me) was collapsed to two levels (Yes or No). Yes included some avoidance, very much avoidance and no longer contact and No included no avoidance.

[c] Here a Yes or No response scale was applied.

borrowers for completed or diligent loans, are somewhat less likely to lend again when loans are in process (perhaps one loan at a time is enough!), and are much less likely to be ready to lend again to a borrower associated with a delinquent loan.

5. Conclusions

This study represents, to the best of our knowledge, the first academic investigation of personal loans. Our primary purpose was not to describe the distribution of characteristics of personal loans, which would have necessitated some kind of random sample of loans. Our sample, however, with its disproportion of lower income and higher part-time employment status borrowers, provided a sufficient number of borrowers and lenders for us to gain an understanding of the range of loan characteristics: the purposes of these loans, the amounts involved, whether there is a formal written contract (or IOU), expectations of interest, collateral, etc. Beyond this descriptive information, we were predominantly interested in the role of the self-serving bias in conditioning borrowers' and lenders' encoding and recall of loan experiences, the impact of loans on feelings, and the effects of loans on the relationship between parties.

We do, indeed, find strong evidence of pervasive, self-serving bias for borrowers and lenders. Borrowers were equally likely to recall loans they received in the last month, but less likely to recall loans made earlier in time than were lenders. Borrowers were also less likely to report that the repayment date had passed, and reported higher paid-back ratios than lenders for all loans (and specifically for loans whose agreed upon repayment date had passed). Borrowers less often recalled the existence of an agreed repayment date, more often reported that loans were initiated by the lenders, and believed that lenders had felt less pressured into making the loans than lenders reported themselves as having been. When delinquent in paying off loans, borrowers were prone to rationalization, they were more likely to reframe delinquent loans as gifts, and – regardless of passed or unpassed payment date – were more likely to believe that they would ultimately pay off the loan. These different perceptions of loan status, and more generally diverse self-serving judgments by borrowers, may lead to feelings that alienate the parties of a loan from each other.

Beyond diverse evidence for a self-serving bias, we also found evidence of another, unexpected, regularity: the strikingly divergent consequences of loan delinquency on the perceptions of borrowers and lenders, including the perception of the relationship between them. This divergence can be seen in the emotions the two parties experience in connection with the loan. Borrowers' emotions are most closely associated with whether the loan has been repaid or not, rather than delinquency. Delinquency does not make a big difference, perhaps because the vast majority of delinquent borrowers are convinced that they will eventually repay the loan. For lenders, on the other hand, the repayment date seems to play a key role in assessing the borrowers' intention to pay back the loan. The borrower missing the repayment date seems to lead lenders to conclude that the loan will never be paid. Even more dramatic than the impact of delinquency on lenders' feelings about the loan is its impact on lenders' feelings about the relationship. Lenders are profoundly alienated from borrowers when borrowers are delinquent. Borrowers, in contrast, are only slightly nonplussed by their own delinquency. Friction between the parties is then exacerbated by the tendency of both to project their own feelings on their counterpart. Lenders project their alienation on borrowers, while borrowers seem to have a blind spot about how their behavior affects lenders.

6. Limitations

Inevitably, for a study of this type, there are things we would do differently if we could begin from scratch. Perhaps most obviously, a more representative sample of loans would have been desirable. Unfortunately, by their very nature, no record is usually kept of personal loans, so there is really no way to sample over loans, and instead it is necessary to sample people and ask them about loans they have made. It is unclear whether such a sample would produce a larger or smaller sample of loans, per capita. We also have no idea whether it would produce a more-even or less-even distribution of borrowing and lending. If lending is widespread in the population, but borrowing is concentrated in a more disadvantaged population stratum, then it is quite possible that a representative sample would produce a more uneven mix of borrowing and lending than occurred in our sample, and might also produce a greater discrepancy in the demographics of borrowers and lenders. Although a representative sample would certainly be an improvement, we are doubtful that it would make a great difference in our two main findings: the prevalence of self-serving bias, and the pernicious qualities of delinquent personal loans.

There are other changes we would make as well. For loans that have been paid off, it would have been helpful to ask whether they were paid off on time. Given our failure to ask, we cannot distinguish between completed loans that were or were not paid off diligently. We also regret not asking lenders about how much they reminded borrowers about payback in the case of paid off loans. Therefore, we cannot investigate whether the inconsistent perception of reminding is prevalent among paid off loans or only restricted to delinquency. In addition, we regret not having asked partners' income status, which prevents us from testing whether feeling magnanimous and feeling beholden may depend on the relative incomes of the parties. Finally, we regret not having asked respondents to report their credit score, to gain a more detailed picture about lender borrower differences in income status.

7. Final comments

An American proverb recommends that "before borrowing money from a friend decide which you need most." Our results seem to support the wisdom of the advice, although perhaps not quite as strongly as might have been the case. Certainly,

there are big differences in perceptions between borrowers and lenders. Borrowers are more likely to forget having taken the loan than lenders, are more likely to view it as having been paid off – or if not paid off to have been *more* paid off – and more likely to have reframed unpaid loans as having really been gifts disguised as loans. All of these patterns pose hazards for lenders, especially if they hope that their magnanimity will be rewarded with ongoing appreciation. However, the really big pitfalls for personal loans arise for delinquent loans – loans that are not paid off by the appointed time. Delinquency leads to enormous discrepancies in the perceptions of borrowers and lenders, and to a negative, albeit different, constellation of emotions as a function of role. Some of the problems arising from delinquency could perhaps have been avoided if partners had a contract (e.g., IOU). Such a relational contract could have included the date and the mode repayment and the possible consequences of delinquency. Unquestionably, a contract like this increases the resemblance of personal loans to commercials loans as it depersonalizes the transaction. At the same time, however, these could also protect partners from their own and their partners' self-serving behavior and viewed as a commitment device. Such contracts could eventually decrease lenders' hazards and limit borrowers' self-serving behavior by explicitly stating the conditions of the loan and the repayment.

Fortunately, however, at least in our sample, a minority of loans seem to end in delinquency. A more accurate, if less pithy, proverb might have elaborated: "Before borrowing money from a friend, *if there is any chance you won't be able to pay it back in a timely fashion*, decide which you need most."

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.joep.2012.06.002.

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The pernicious role of asymmetric history in negotiations

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ABSTRACT

The role of history in negotiations is a double-edged sword. Although parties can develop trust over time, there are also countless examples of protracted feuds that developed as a result of conflicting interpretations and invocations of history. We propose that, due to biased invocations of the past, history is likely to play a pernicious role in negotiations – particularly when given an asymmetric history in which one party benefited at the expense of the other. We test this prediction in two, two-stage experiments. We find that asymmetric history in a first stage leads to increased impasses in a second stage, but that this effect holds only when the second stage pairs the same two parties who shared the asymmetric history in the first.

1. Introduction

Negotiating parties with a shared history are likely to have conflicting perspectives on the significance and interpretation of their histories. Prior research has found that conflicts arising from differing interpretations of common information are more likely in complex situations, which provide opportunity for subjectivity and eventually impede agreement in negotiations (e.g., Babcock et al., 1995, 1996). History, which is complex and subjective, could provide especially fertile ground for biased claims that impede agreement in negotiations.

In this paper we show that a history between people in which one party (the 'winner') previously gained at the expense of the other (the 'loser') increases the chance of impasse in a subsequent negotiation, due to the parties' different perspectives on the issue of compensation. We test the prediction that previous losers will behave as if the past is relevant to the current dispute, and that compensation is appropriate, whereas winners will behave as if the past has no bearing on the present, so that compensation is uncalled for.

We present results from two experiments illustrating the importance of a shared asymmetric history in bargaining impasse. Both show that negotiating dyads sharing an asymmetric history are less likely to settle a subsequent negotiation than are pairs with a symmetric history. We also find that impasses between winners and losers are less likely to occur if the

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negotiation is between a different winner–loser pair from the one that shares an asymmetric history. This is because losers seek compensation only from winners who won at their expense.

In the next section, we summarize literature addressing how and why asymmetries between bargaining partners can lead to inefficiencies, as well as the circumstances in which parties seek, and offer, compensation for inequalities through redistribution in negotiations and allocation decisions. We also discuss how bargaining partners can exploit the existence of multiple fairness views by selecting those that justify their claims. We then, jointly, present the methods of the two experiments and their results. We close with a summary of conclusions and limitations.

2. Asymmetries between bargaining partners

Experiments involving asymmetries between bargainers have examined situations in which, for instance, individuals negotiate over how to divide a joint product to which they have contributed unequally (e.g., Birkeland, 2013), negotiate over how to divide lottery tokens that provide a fixed probability of winning but an amount to be won which differs between the individuals (e.g., Roth and Malouf, 1979; Roth et al., 1981), or a 'shrinking pie' game in which the 'pie' shrinks faster for one party than for the other (e.g., Weg et al., 1990). The complexity associated with such asymmetric situations can support different, opposing, interpretations of fairness (for a review on different interpretations of fairness see Konow (2005), and Cappelen et al. (2007, 2013) for experiments demonstrating the heterogeneity of fairness views). This *fairness dispersion* (Konow, 2005) may result in incompatible claims, leading to inefficiencies such as costly impasses or prolonged time to settle. Additionally, people have a tendency to hold – or at least argue in favor of – concepts of fairness which justifies the most beneficial outcome for themselves (for allocation decisions see Konow (2000), and Messick and Sentis (1979); for ambiguous situations see Dana et al. (2006, 2007), and Haisley and Weber (2010); for contextually rich situations in bargaining see Babcock and Loewenstein (1997), Babcock et al. (1995, 1996), Loewenstein et al. (1993), and Thompson and Loewenstein (1992)).[1]

Birkeland and Tungodden (2014) incorporate fairness into a theoretical model of bargaining between fair-minded and self-interested partners. This model posits that if partners assign sufficient weight to fairness views that are incompatible, they may end up in an impasse solely out of principle. In this paper we examine a situation in which parties who share an asymmetric history have to agree how to divide a joint product. We predicted that an asymmetric history,[2] in which one party benefited at the expense of the other, would result in incompatible views on how to settle a current negotiation. Hence, we expected that negotiators would be more likely to reach agreement if they either shared a symmetric history (i.e., neither party benefited at the expense of the other) or when they both experienced asymmetric histories which were not shared.

When parties are in symmetric situations, an equal split is typically the focal settlement (e.g., Nydegger and Owen, 1974). But as soon as there is asymmetry between parties, multiple views on how to divide resources are likely to arise, even under conditions of full information, which can lead to impasse. In "shrinking pie game" studies by Weg et al. (1990), for example, paired subjects took turns offering divisions of a cash amount that shrank every time the offer was rejected. Settlement rates were lower – and the ultimate amount shared smaller – when the amount shrank faster for one member of a pair than the other. In other bargaining studies (Roth and Malouf, 1979; Roth et al., 1981), paired individuals bargained over relative chances of winning a pre-assigned prize, and the prize to be won was either the same for both parties or different. When subjects were informed of their partner's prize, disadvantaged individuals (i.e., those with the lower prize in the pair) invoked fairness arguments via messaging to justify their claim for getting a greater than 50% chance to win. They argued that they should be compensated for their disadvantage so as to equalize expected earnings.

Not only what happened in the past matters, but also why it happened. In two experiments, Cappelen et al. (2007, 2013) demonstrate that people are in fact willing to make up losses by redistribution if the individual getting the short end of the stick did so as a result of bad luck and not their own selfish choices. Compensating losses resulting from misfortune seems to be a commonly accepted notion of fairness.

Research in organizational behavior finds that when people experience unjust losses (for instance a pay-cut or differing pay rates for the same work), they may also seek to restore equity. For example, Greenberg (1990) found that company employees whose salaries were temporarily cut engaged in increased inventory theft, apparently seeking compensation for the wage loss. In a follow-up experimental study manipulating relative pay-rates, Greenberg (1993) found that subjects assigned a low pay-rate relative to others were more likely to effectively steal from the experimenter. John et al. (2014) similarly found that people who were randomly assigned to a lower pay rate and who knew of others' higher pay rates were more likely to cheat to increase their pay.

[1] Not every study finds evidence for biased invocation of fairness views. Gächter and Riedl (2005), for instance, did not find any evidence for opportunistically endorsed fairness ideals in a study in which parties bargained over splitting a joint product. Likewise, Cappelen et al. (2007) did not find that stakeholders in a dictator allocation adhered to the fairness view that benefited them the most.

[2] We employ the term "history" in its ordinary usage, not in the way it is often used in game theory. History is related to reputation formation in game theory, summarizing past behavior and signaling the person's type (e.g., Roth and Schoumaker, 1983). It can contain information about the partner's intention and, hence, affect expectations about behavior. For instance, when people who share similar history (e.g., similarly generous in a dictator allocation) negotiate, they are found to be more efficient bargainers than pairs composed of opposing types (e.g., Charness, 2000). In contrast, we only refer to the presence (or absence) of an unfair allocation incident in one's past, which one's current partner may or may not share.

In contrast to these previous experiments, we focus on asymmetry due not to differing inputs or unequal potential payoffs between subjects, but rather to the lopsided allocation of the jointly produced gains from a previous interaction. That is, we focus on a situation in which partners share a history involving the unfair allocation of a joint product, with one party having benefited at the expense of the other.

The prior study dealing most directly with the role of history in negotiations was conducted by Camerer and Loewenstein (1993). Subjects were assigned the role of seller or buyer, and negotiated the sale of an item. Both parties were informed of their own reservation price, but not that of their counterpart. All dyads successfully settled this negotiation, after which their private reservation prices were revealed to the other party. The same partners then negotiated the same case a second time, leading this time to a significant proportion of impasses. To explain the higher level of impasses in the second round, the authors argued that those who profited less in the first round tried to recoup their losses in the second round, while those who did well in the first round viewed that as irrelevant to what they should obtain in the second. We provide much stronger evidence for such an account by experimentally manipulating the history of the two parties.

In the present two-stage experiments we manipulated the nature and the "shared-ness" of players' history in stage one. In all conditions in all studies, pairs of subjects worked on a task (answering trivia questions) and their joint earnings were equal to the sum of correct answers provided by both members of the pair. In the first stage of the asymmetric treatment, the joint earnings were allocated entirely to the person who made the greater contribution (answered more questions correctly), creating a patently unfair allocation. In the symmetric treatment, in contrast, the joint proceeds were split equally between the two parties. We hypothesized that a shared, asymmetric history would increase the likelihood of subsequent bargaining impasse in a second stage of interactions between the pair in which they negotiated the split of a new joint product. We expected that the two members of the pair would have incompatible views on the relevance of the past (i.e., stage one) and would, as a result, propose incompatible divisions. The losers from stage one would seek compensation in the form of a more advantageous distribution in stage two, whereas the winners would not share this view. These incompatible views, we predicted, would lead to costly impasses in the second stage. We anticipated that this compensation seeking would not be present when subjects shared a symmetric history (with no unjust allocation mechanism), nor when the loser was re-paired with someone irrelevant to his/her personal history.

By making a pair's history the result not of a deliberately chosen strategy, but rather a lopsided allocation of contribution determined by chance, we examined a situation in which history provided no information about an individual's 'type'. Hence, there was no scope for reputation formation, nor for negative attributions of the other party – either of which could have had effects, other than those we were interested in, on subsequent negotiations.

3. Experiments

In both studies, two subjects were paired and negotiated over how to divide a sum of money. The basic structure of the two experiments was very similar. So, after separately detailing the methods employed in each, we present the results jointly.

In both experiments, anonymously paired subjects interacted in two consecutive stages. The first stage established the history manipulation and the second involved the actual negotiation of interest. The sole effect of the first stage was to establish an asymmetric or symmetric history between partners based on the allocation employed. A survey concluded both studies. Final earnings were contingent upon performance. There was no show-up fee.

In the first experiment, we manipulated whether history between paired partners created symmetric or asymmetric outcomes, with the prediction that pairs with asymmetric histories would be less likely to settle in the negotiation of the second stage. In the first stage, all subjects completed a trivia quiz and each individual's production was determined based on their quiz performance (i.e., number of correct answers times pay-rate). Next, these individual productions were pooled within each pair. In the symmetric condition, the pooled production was then split evenly between both subjects, but in the asymmetric condition the entire joint production was given to the subject who had scored higher on the trivia quiz, or, in the event of a tie, to the randomly selected winner. In the second stage, both subjects again completed a trivia quiz and then negotiated a division of their joint production from this stage.

In the second experiment, all pairs were in the asymmetric condition. The manipulation was whether they played with the same or a different partner in the second stage, ensuring in all cases that a first-stage loser was paired with a winner. The goal of this experiment was to test whether the impasse observed among asymmetric pairs in the first experiment would be reduced if losers and winners were re-paired, so as to maintain the individuals' relative outcomes in the first stage, but to eliminate the "shared-ness" of the history.

In both experiments, immediately after both quiz submissions, we asked subjects to provide estimates of the minimum and maximum they believed they could have scored in that game, as a view into their own estimated contributions to the joint production.

3.1. Experiment 1

The first experiment was run over the course of five sessions on two consecutive days in the fall of 2011 at Corvinus University in Budapest, Hungary. Subjects ($n = 154$) were recruited via flyers and email lists. Upon arrival, they were randomly assigned to one of two treatments (the 'symmetric' or 'asymmetric' condition), and then were assigned to sit in one of the

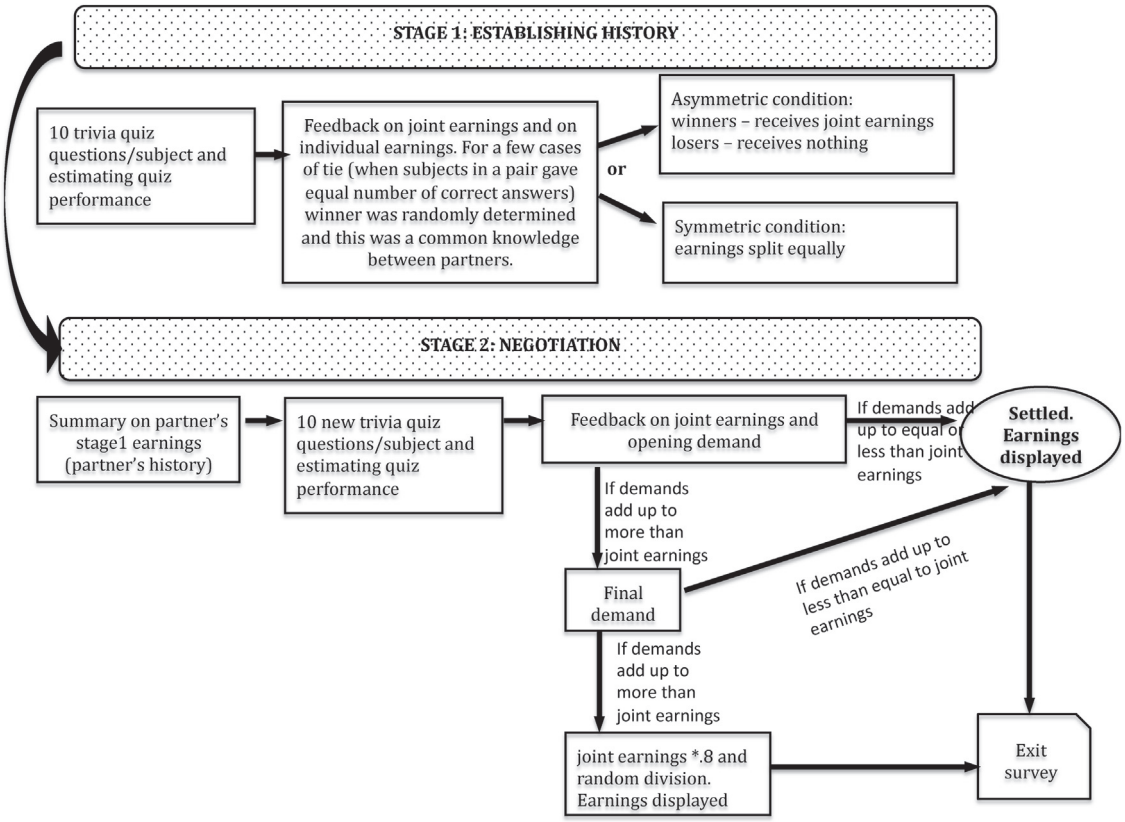

Fig. 1. Basic structure of the two experiments.

two lecture halls, A and B. Equal numbers (roughly half) of the subjects in each lecture hall were assigned to each condition. Subjects received detailed instructions both on printed sheets (translations of original Hungarian experimental materials are reproduced in Appendix B) and also read aloud by the experimenter, and any questions they had were answered individually. When the experiment ended, subjects received their payments in cash. Each experimental session lasted for approximately 30 min.

Pairings were random, each consisting of one subject from hall A and one from hall B. Communication within the pair occurred via paper slips conveyed by experimenters between halls, and was limited to second-stage negotiation demands (in Hungarian Forints or HUF). The top panel of Fig. 1 outlines the experimental flow.

In the first stage, subjects answered a 10-item, binary-response trivia quiz.[3] Each pair was given a random subset of the possible questions, and each member of the pair worked independently on the same ten items. Each correct response resulted in a 90 HUF (then roughly equivalent to $0.45) input to the joint production. After they submitted their answers, subjects estimated the minimum and maximum number of questions they believed they had answered correctly.

In the symmetric condition, a pair's joint earnings were divided equally between the two subjects. In the asymmetric condition, the joint earnings were given *in toto* to only one of the two subjects: either the one who answered more questions correctly or, in the event of a tie (which occurred 10.5% of the time), to one who was randomly chosen.

At this point, subjects knew how much they had jointly produced, and how much of this joint production had been awarded to themselves and to their partners. Importantly, though, and in contrast to previous experiments (e.g., Cappelen et al., 2013; Konow, 2000), subjects were not informed about their individual contribution to the joint earnings (i.e., how many questions they personally had answered correctly). In the few cases of a tie (when the winner was randomly determined), this was disclosed to the subjects, and they were told that the recipient of the full amount had been determined randomly.

The second stage in the experiment (see lower panel of Fig. 1) began with a summary of their and their partner's stage-one history (i.e., both individuals' earnings and how the division was made).[4] The two subjects then independently answered ten new questions and again provided a minimum and maximum estimate of how many questions they had answered correctly.

[3] Sixty percent of the trivia questions were selected from the standard Hungarian high school curriculum and chosen to be easy for the subjects to answer correctly. The other 40% were advanced questions from fields such as math, arts, geography, physics and history, selected to be sufficiently difficult so that performance would be largely a matter of chance. This way being the winner in stage one (in asymmetric conditions) was largely due to chance.

[4] This is when subjects in the different-partner condition first learned of their new partner's results from the first stage. To maintain consistency across conditions, it was also shown in the same-partner conditions, even though the information would not have been new to them.

Joint earnings were calculated and reported as in stage one, but this time with no indication of who (if either) had answered more correctly. The negotiation phase then began.

The negotiation, a double-auction (Myerson and Satterthwaite, 1983; for its use in a behaviorally oriented study see Valley et al. (2002)) was unfolded in two rounds. In a given round, both members of a pair simultaneously submitted their demands. No other communication (e.g., messaging, etc.) was permitted. In the first round, each subject was asked to indicate how much money he wanted for himself from the joint earnings. If the sum of the pair's first round demands was equal to the joint production of the second stage, they settled, and both players' earnings were displayed to them. If the sum was less than the amount to be distributed, then the unclaimed portion was split evenly and added to their respective demands, resulting in settlement as above. If the sum was more than the pie, then they failed to agree and entered the second (and final) round of negotiation. This round proceeded identically to the first except that, in the case of non-agreement, the sum was multiplied by 0.8, and divided randomly between the two (with all divisions equally likely). They were then informed of their own and their partner's stage-two earnings.

Finally, everyone was informed of his or her total earnings in the experiment. An eight-item, post-experimental survey inquired about their views on fairness and fair behavior in the game, their beliefs about whether losers in the first stage should be compensated in the second stage (only in the asymmetric condition, where winners/losers existed), how happy they felt with the results, and how fair they perceived their partners' behavior to have been.

3.2. Experiment 2

The flow of experiment two was almost identical to that of experiment one, although this one was programmed in Flash and administered by computer. Correct trivia answers were worth 100 (instead of 90) HUF. It was conducted in 25 group sessions in spring 2012 at computer facilities at the Corvinus University. Each group session lasted approximately 20 min. All subjects in a group sat in the same room, in front of a computer, and were paired with an unknown person in the same room. In this experiment, a slightly higher proportion ended up with tied scores in the first game (13.5% in total, comprising 15.5% of subjects in the different-partner condition and 11.5% of those in the same-partner condition).

4. Results

Combining the data from the two experiments, there were altogether 392 subjects (196 pairs) in three pair-level treatments,[5] broken down as follows: there were 78 subjects (39 pairs) in the symmetric history (with same-partners) condition from the first experiment. Pooling the identical conditions from both experiments yielded 198 subjects (99 pairs) in the asymmetric history, same-partner treatment. Finally, there were 116 subjects (58 pairs) in the asymmetric history, different-partner treatment from the second experiment.

Key demographics did not differ across treatments. Ninety-six percent of the subjects were currently enrolled in higher education, and 57% were males. The median income level was within the second-lowest quartile of the Hungarian population, and the mean age in years was 21 (3.03). For detailed demographics see Table A1 in Appendix A.

Our key prediction was that pairs in the asymmetric same-partner condition would be more likely to reach an impasse than those in the symmetric and asymmetric different-partner conditions. Consistent with this prediction, 27.7% of asymmetric-same pairs reached impasse – roughly three times more than the 7.7% and 8.6% observed in the symmetric and asymmetric-different conditions, respectively. Table 1 presents a logistic regression which shows that these differences are significant, with odds ratios of 0.18 and 0.32 after controlling for experiment wave (since the asymmetric same-partner condition was collected in two different experiments).

Next, we investigate individual behavior, to gain insight into the etiology of impasses. In the asymmetric conditions, there were four individual-level cells formed by crossing the stage-one outcome (won/lost) with stage-two pairing scheme (same/different partner).[6] In the symmetric condition there were no losers or winners, so both parties' results are included within a single column.

Table 2 presents first and second round demands by individuals in different experimental conditions, as well as statistical tests of the differences between key comparison groups. It provides partial support for the idea that losers and winners had different views on how to divide the joint earnings, and that this depended on whether they bargained with the same or a different partner.[7] Note that five same-partner losers and two same-partner winners claimed the whole production in their opening demand, as did three same-partner losers in their final demands.[8]

[5] We distinguish between pair- and individual-level factors. This is necessary, since within asymmetric pairs we always had two antagonistically manipulated individuals (i.e., losers and winners).

[6] Although subjects were not, strictly speaking, randomized to stage one outcome, we argue that assignment was practically random due to the choice of trivia questions on which performance should have been effectively random.

[7] To compare individuals' demands (in HUF) with their estimated and actual performance (in number correct) across the two experiments (where payments differed slightly) while accounting for the total size of the joint production, we treat all demands and estimated contributions as proportions of the amounts to be divided. Differences between the two studies were, in fact, minuscule.

[8] Stage-two mean number trivia correct was about ½ question higher among the symmetric cell (7.1) than the rest, the latter of which did not significantly differ from each other (their pooled mean is 6.6). First- and second-stage individual numbers trivia correct were uncorrelated, with Pearson's $r = 0.04$.

Table 1
Logistic regression of impasse by treatment and experimental wave. Pair-level analysis. Compared to the asymmetric same-partner reference, both symmetric same-partner and asymmetric different-partner conditions have significantly lower incidence of impasse. Experimental wave has no effect.

Constant	−1.21***
	(0.30)
Symmetric	−1.71**
	(0.70)
Different-partner	−1.15**
	(0.56)
Experiment 2	0.44
	(0.46)
χ^2	12.51***
df	3
N (pairs)	196

Standard errors in parentheses.
**$p \leq 0.05$, ***$p \leq 0.01$.
Note: Coefficients are presented on the log odds scale.

Same-partner losers' opening demands (row one in top panel) did differ from those of different-partner losers and symmetric subjects, but not from same-partner winners. By the second and final round, and conditional on first-round disagreement,[9] same-partner losers' final demand did exceed each of these other groups' (first row in the lower panel). This means that same-partner losers asked for more than same-partner winners, different-partner losers and symmetric subjects in their final demands. In addition, from the last row of this table we see that same-partner losers were more likely to 'hold out' (i.e., demand the same amount in the second round after a first-round disagreement) than were same-partner winners or symmetric subjects, but not significantly more than different-partner losers (although the direction is as predicted; 13% more same-partner losers insisted on their demands than different-partner losers).[10] This, we speculate, is an indication that same-partner losers viewed their initial demand as fair, rather than as strategic.

It may be revealing to compare actual demands with maximum and minimum estimated contributions (numbers of questions answered correctly on the quizzes). However, since the elicitation of these beliefs was not incentivized, their veracity is uncertain. Therefore, we present these analyses, as well as analyses of the subjective survey questions, in Appendix A.

5. Discussion and conclusions

Our goal was to demonstrate that a dyadic relationship featuring a mutual, asymmetric history provides more fertile ground for impasse than one in which the parties either arrive at the negotiation with symmetric histories (in which neither previously had the upper hand), or with asymmetric histories that are not linked with one another. Pairs who had a previous production which was awarded entirely to one of them at the expense of the other were less likely to agree on how to divide a new joint production – even at the cost of losing 20% of the pie and being subject to a random division. It was not their individual history that had this effect; there was no excess of impasse when winners and losers were paired with different losers and winners (respectively), but only when they were re-paired with the same ones. These results demonstrate that the unfortunate party's wish for compensation is often unrequited by the fortunate one, leading to costly impasses.

In our study we analyzed average demands and looked at subjects' opening and final demands and their insistence upon them.[11] When it came to demands, and especially final demands, same-partner losers asked for a significantly greater share of the joint production than their winner partners, different-partner losers and symmetric players. In addition, same-partner losers were more insistent upon their demands than same-partner winners or symmetric subjects (but did not differ in this regard from different-partner losers, although the latter did not reach impasse as often by virtue of making more modest opening demands). Same-partner losers' failed claims for compensation from the party with whom they shared history suggest that impasse arose from incompatible notions about the appropriateness of restitution. This pattern is consistent with previous literature on equity-restoration (e.g., Greenberg, 1993, 1990), which finds that, after experiencing an unjust financial loss (such as a wage-cut), people want to restore equity. It is also consistent with Cappelen et al. (2007, 2013), in which spectators and some stakeholders were willing to redistribute losses if the lopsided contribution was due to a lower assigned return rate on investments, or just being unlucky in investment decisions. In our study, we suspect that

[9] This is a necessary distinction, since reaching this round may, e.g., select for more inherently intransigent individuals. Even if that is the case, individual intransigence should be distributed the same across conditions, and so any difference observed between conditions should still be indicative of treatment effects conditional on first round impasse. Since we will only compare final demand based on effectively randomized attributes, no endogeneity is introduced.
[10] To verify that these findings are not driven solely by the randomly chosen winners/losers (i.e. where performance was equal), we compared opening/final demands and holding-out percentage between the random and non-random subsets of the conditions compared here. With the borderline exception of final demand, no significant differences were detected (see Table A2 in Appendix A).
[11] Analyzing demands is a similar approach to Gächter and Riedl (2005).

Table 2
Opening, final demands and holding out proportions for each group.

	Same-partner loser $N = 99$	**Same-partner winner $N = 99$**	**Different-partner loser $N = 58$**	**Different-partner winner $N = 58$**	**Symmetric $N = 78$**	**Same-partner loser vs same-partner winner**	**Same-partner loser vs different-partner loser**	**Same-partner loser vs symmetric**
Opening demand mean (SD)	0.55 (0.16)	0.54 (0.11)	0.51 (0.10)	0.52 (0.07)	0.51 (0.07)	$t(172) = 0.74$	$t(155) = 2.01^{**}$	$t(166) = 2.35^{**}$
Those who failed to settle in first round								
	Same-partner loser $N = 59$	**Same-partner winner $N = 59$**	**Different-partner loser $N = 29$**	**Different-partner winner $N = 29$**	**Symmetric $N = 28$**	**Same-partner loser vs same-partner winner**	**Same-partner loser vs different-partner loser**	**Same-partner loser vs symmetric**
Final demand mean (SD)	0.55 (0.15)	0.47 (0.10)	0.49 (0.06)	0.49 (0.08)	0.49 (0.07)	$t(116) = 3.30^{***}$	$t(84) = 2.48^{**}$	$t(85) = 2.10^{**}$
Holding out	41%	14%	28%	24%	18%	$\chi^2(1) = 10.98^{***}$	$\chi^2(1) = 1.44$	$\chi^2(1) = 4.45^{**}$

Degrees of freedom account for whether tests assume equal or unequal variances.
$^{**}p \leq 0.05$, $^{***}p \leq 0.01$.

compensation seeking was a form of redistribution request for an unjust loss, since the loser was not responsible for receiving none of his stage-one share. However, unlike Cappelen et al. (2007, 2013), or Konow (2000), we are unable to determine whether claims were supported by any fairness view and, if so, whether subjects opportunistically endorsed the fairness ideal that was most advantageous to them.

Finally, we consider the comparison of actual demands with believed minimum and maximum contributions. As noted, elicitation of these beliefs was not incentivized, leading to some uncertainty about what they truly reflect. With these qualifications in mind, however (and as detailed in Appendix A), it is perhaps still interesting that same-partner losers asked for their maximum estimated contributions while individuals in all other roles and conditions asked for less than their maximum estimated contribution.

5.1. Limitations

Although we suspect that the increased prevalence of bargaining impasse among pairs with shared, asymmetric, history is due to the interplay between history and self-serving bias, further research could provide more definitive tests of whether demands were justified by fairness views – perhaps by permitting, and examining the content of, messaging between partners. Another approach would be to elicit incentivized beliefs from each partner just before the negotiation, about how they think a neutral third party would split their joint earnings. This would allow us to ascertain their true beliefs about fair compensation for the first round outcomes, and to assess the extent to which these differ between roles and experimental conditions.

Another design choice and potential limitation of our studies is that, unlike in other works on dividing joint products (e.g., Cappelen et al., 2007; Konow, 2000), we did not inform subjects about their exact contribution to the joint earnings. In many if not most situations (e.g., workplace collaborations), this is probably realistic; people are often not aware of how much they contribute to a joint product; yet there are certainly situations, such as investments, in which different investors contribute different (known) amounts, where different individuals' contributions are common knowledge.

Finally, throughout the negotiation, subjects were never informed about their partner's demands, but only about whether they had made a deal. This feature is different from many negotiations in which parties exchange specific offers, even if they rarely reveal their reservation prices.

In sum, our results support the idea that bargaining impasse is more likely to happen between people with an imbalanced history, in which one party gained at the expense of the other. The current research helps to explain both why such disputes are so common in the world and why invocations of the past seem so common within them.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jebo.2015.05.016.

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Corrupted norms, compensation-seeking and punishment after experiencing inequity

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Abstract

We demonstrate how a shared experience of distributive injustice shapes people's compliance towards a party unrelated to the inequity experienced. Participants experienced unfairness together and were then prompted to comply with a third party in a subsequent income-reporting game with no positive externalities of complying (i.e., no redistribution). People sought compensation via under-compliance, which was fueled by corrupted beliefs about the norms. In another treatment, wronged people who could indirectly retaliate against their wrongdoer by further decreasing compliance did so, despite this behavior falling below their believed norms. We conclude that, without some means of cleaning the slate and restoring the eroded norms, compliance with a third party can be damaged after experiencing inequity.

Keywords: history, compliance, beliefs about norms, punishment, beta regression

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1. Introduction

In the aftermath of some collective injustice, people might look forward rather than seeking compensation for the past. Wronged peoples may focus on reconstruction, complying with new leaders who are unrelated to their mistreatment. This reconstructive norm is inarguably crucial to the rebuilding process, as it is the bedrock upon which welfare states, social capital, and trust in institutions are founded. Such equanimity does not, however, always prevail. Instead, people may form corrupted beliefs about how others will behave and then act accordingly. This may include compensation-seeking from anyone, at any price. This behavior, effective in the short term as it may be, can in the longer term hinder societal recuperation and perpetuate the corrupted norms. An extreme fixation with wrongs of the past can even inspire revenge against the wrongdoer, even at the price of further erosion of norms.

On a smaller scale, imagine a manager who refuses his employees overtime pay to which they feel entitled. These employees could conceivably react by breaking some company rules to their own monetary benefit, even though the rules (and the money) are unrelated to the manager. This would be fueled by employees' corrupted beliefs about what similar others are doing (i.e., the believed normative behavior in their group). Suppose further that their rule-breaking, if over some threshold, will cause the company to materially punish the manager for not curtailing his subordinates' behavior. One can easily imagine the affronted employees exploiting this, purposefully pushing their behavior past this critical level, deviating from what they believe others are doing. Hence, beyond simply recovering lost funds, under-compliance offers the feeling of getting even, albeit at the price of further corrupting norms.

This paper presents results of an experiment showing that a group of unfairly treated people sought compensation via under-complying with a party unrelated to the inequity they experienced. In addition, it also demonstrates that people held corrupted beliefs about how much others would comply, which beliefs caused the reduced compliance. Finally, we find that wronged people were will-

ing to further decrease compliance toward the third party to the point where this inflicted financial harm on their wrongdoer, indicative of indirect punishment. Carrying out this punishment entailed going below what they believed the others would do in this situation.

2. Reviewing relevant literature

Those who get the shorter end of the stick in some distribution may act to restore some or all of the loss. Furthermore, when the loss arises due to an intentional action by another person (and not just chance), it is perceived as unfair, prompting (potentially costly) revenge upon the wrongdoer (e.g., Blount, 1995). The observation that an intentional unfairness stings more than an unintentional one indicates that, beyond the monetary outcome per se, it also matters whether the chosen allocation is in accord with whatever fairness norm is believed to apply (Falk et al., 2008; Loewenstein et al., 1989; Rabin, 1993). This reaction is captured as altruistic punishment in ultimatum games (e.g., Fehr & Fischbacher, 2003; Gneezy & Fessler, 2012; Pillutla & Murnighan, 1996): people are willing to pay to punish those who violate the tacit norm of kindness in situations when pro-sociality and self-interest are pitted against each other.

The conjecture that people experience a loss when failing to reach an income target — be it an expectation, a promise or any kind of reference point — was recognized by Kahneman & Tversky (1979) in their seminal paper. This idea echoes early social psychologists, who noted that being in a disadvantage compared to some kind of expectation can cause feeling of inequity and calls for behaviors that restore equity or simply compensate for the loss (Adams, 1965; Homans, 1974). In distributive situations, unless there is a good a rationale for the contrary, people expect the person in the dividing position to refrain from full self-interest and show some concern about the receiver's welfare. When this expectation is violated, people may experience not only the material loss, but also feelings of anger or spite against the dividing party, which may drive them to take revenge (Pillutla & Murnighan, 1996).

Field studies on organizational behavior find that perceived distributive injustice in organizations is "associated with sabotage behavior that aimed to restore equity" (Ambrose et al., 2002, p. 960.). Being paid less than what is expected or what is believed to be fair would be one clear example of this. In fact, scholars in organizational and management research propose that the key predictor of pay-dissatisfaction among employees is when their beliefs on how much they should have have been paid is not met (Williams et al., 2006). Consistently, in a large-scale field study Greenberg (1990) find that underpaid workers resort to inventory theft to compensate their losses.

When unfair loss is produced in lab settings, compensation-seeking and equity-restoration consistently follow. As Houser et al. (2012) point out, though, compensation-seeking can also occur without negative reciprocity.[1] The authors report a two-stage experiment, where in stage one participants participated as receivers in a dictator game, and in stage two, privately tossed a coin and reported its outcome, which determines their earnings. Those who received little or nothing in the dictator game reported having been treated unfairly, and lied more about having gotten a favorable coin toss — a vivid example of compensation-seeking from unrelated, third parties without the presence of negative reciprocity.

Equity restoration is one step further, as it involves negative reciprocity. Here, beyond (or even apart from) repairing some or all loss, one's behavior is fueled by the wish to get even at the expense of the specific person responsible for the unfairness. Greenberg (1993), for instance, demonstrated in the lab that participants who were paid less than expected for completing a clerical task stole from the experimenter (who was held responsible for the pay cut). In another lab study, Dezső et al. (2015) found that negative reciprocity can occur even toward an incidental wrongdoer. In stage one of their two-stage study, asymmetric histories were experimentally established by unfairly allocating jointly created

[1] For more details on the differences between these two motives see, for instance, Stillwell et al. (2008).

proceeds between two parties. That is, one party of the dyad received the entire joint production. In the second stage, players had to negotiate on how to divide new, jointly-produced proceeds. When this negotiation was between two partners who had been paired with each other in the first stage, the previous "loser" insisted on compensation from the previous "winner", even when such insistence caused resource loss for both parties.

The negative impact of prior or ongoing unfair loss has also been documented in tax research. Theoretical papers (e.g., Andreoni et al., 1998; Schnellenbach, 2010) propose, and empirical research confirms (e.g., Bazart & Bonein, 2014; Spicer & Becker, 1980; Fortin et al., 2007), that when an authority mistreats tax-payers, the latter tend to react with increased tax evasion. This suggests that compliance behavior is determined by components beyond the monetary cost of under-complying. In these specific cases, tax-payers use under-compliance as a means for making up their perceived monetary loss arising due to unfair tax schema. One of the main goals of the present paper is to investigate whether inequitably treated people would seek compensation through under-compliance with a party unrelated to their mistreatment and, furthermore, look for evidence of indirect negative reciprocity (i.e., under-compliance with the third party specifically aimed at harming the wrongdoer).

Compliance behavior is often measured in an income-reporting game with no redistribution (e.g., Alm et al., 1992). According to standard models (e.g., Allingham & Sandmo, 1972), this game is a decision under risk, where the decision-maker maximizes his evasion gamble. However, both in lab and real life settings, actual compliance quite exceeds what standard models predict, indicating that there are other factors determining compliance behavior.

One important factor deemed to be responsible for the higher-than-expected compliance is conditional compliance (e.g., Frey & Torgler, 2007; Traxler, 2010), whereby people tend base their compliance upon how much others are complying. Adherence to the (believed) prevailing norms is used to explain why most people pay taxes despite the almost zero marginal cost of evasion (e.g., Alm &

Torgler, 2011; Bobek et al., 2007; Cummings et al., 2009; Slemrod, 2007).[2]

This significance of norms in shaping behavior has been recognized by economists when modeling strategic behavior (e.g., Akerlof & Kranton, 2000, 2005; Charness et al., 2007; Fehr & Gächter, 2000; Krupka & Weber, 2013; Ostrom, 2000). The term *norm* is employed here as a "black box" referring to some impact of the social environment on behavior (Schram & Charness, 2015), where preferences are then conditional upon the norms. This research usually infers norms from the observed behavior (for more details on this, see, Reuben & Riedl, 2013), or from stated beliefs about what others are doing when some coordination is involved (e.g., Croson, 2007; Fehr & Gächter, 2000; Fischbacher & Gächter, 2010).

In more psychologically-oriented research, the importance of norms has also been invoked in determining the underlying factors of unethical behavior (e.g., Mazar et al., 2008; Shalvi et al., 2011). Deviating from the observed or believed norms which apply in some situation imposes some kind of a psychological cost (i.e., shame or guilt) on the actor (Elster, 2009), which the actor then tries to minimize. This strand of research usually specifies norms as moral norms. A recent survey on the difference between social and moral norms, however, reveals a significant overlap between them (for details see, e.g., Tangney et al., 2007). The upshot is that moral norms are formed from both internalized universal moral laws and from a culturally-prescribed set of acceptable behaviors.[3]

In situations where there is no cost of an unethical behavior because the risk of being detected or penalized is clearly zero, it has been found that most people only partially give in to the temptation to cheat (e.g., Houser et al., 2012), lie

[2] This crucial importance of norms echoes social norm theory from psychology, which posits that people hold some kind of a descriptive representation of the prevalent norm in a situation, which then motivates behavior (Cialdini et al., 1990; Cialdini & Trost, 1998).

[3] One can easily imagine internalized cultural (i.e., social) norms becoming one's moral norms — for instance when one gradually endorses the premises of a religion and slowly see its norms of everyday conduct as moral (i.e., absolute) norms rather than relevant only for those in particular who subscribe to the religion.

(e.g., Fischbacher & Föllmi-Heusi, 2013), or deceive (e.g., Gneezy, 2005). In such scenarios, most participants act as incomplete (or partial) cheaters (e.g., Houser et al., 2012), or they maneuver between minor and major lies (Shalvi et al., 2011), or steal only some instead of all available money (Falk & Fischbacher, 2002).[4] One explanation is that the maximizing strategy entails some kind of trade-off between the monetary benefit of exploiting the situation on one hand, and bearing the cost of violating a positive self-image of an honest person (i.e., someone obeying prevalent moral norms) on the other (Bénabou & Tirole, 2002; Ellingsen & Johannesson, 2004; Mazar et al., 2008; Shalvi et al., 2011).

An important implication of norm adherence is that observing or engaging in seemingly minor and sporadic unethical behaviors can be detrimental, since it gradually eliminates the cost of norm violation. The key argument is that one step down the unethical road makes subsequent unethical steps easier, possibly leading to the erosion of norms (Gino & Bazerman, 2009; Milgram, 1963). When people for instance, learn that the others steal, they increase their own stealing (Falk & Fischbacher, 2002). Or, even just seeing others violate norms (e.g., littering) may lead some to relax their own adherence to (unrelated) norms against stealing, which is known as "cross-norm inhibition effect" (Keizer et al., 2008). In others words, once some people relax their norm adherence, others may feel more comfortable violating norms that do not suit them. In the mid- and long-run this can lead to a significant corruption of norms and substantial losses (e.g., Mazar & Ariely, 2006).

Another way to eliminate the experienced cost of deviating from one's beliefs about the pertinent norm is to strategically adjust them to the actual behavior. In a series of lab experiments, Sharma et al. (2014) for instance, demonstrate that when people are manipulated to experience or even just recall episodes of

[4]Some studies also find a gender component, with a greater extent of unethical behavior by males than by females (e.g., Dreber & Johannesson, 2008; Erat & Gneezy, 2012; Friesen & Gangadharan, 2012; Houser et al., 2012), while others found no such differences (e.g., Cappelen et al., 2013).

financial deprivation, they increase cheating. Importantly, these people report relaxed ethical norms of cheating as well, which are found to be associated with their cheating behavior. Note, however, that from their design one cannot tell if reported beliefs are true or if people just reported them such that they aligned with their behavior.

In our research we take the view that beliefs about what others are doing in a given situation are proxies of social norms. Hence, people match their behavior to these beliefs. We also assume that deviating from these beliefs imposes some kind of psychological cost (i.e., discomfort) on the actor. One of our main goals is to investigate how beliefs about the pertaining social norm change after collectively experiencing inequity and the extent to which these beliefs account for the observed behavior.

3. The experiment

The experiment was embedded within a neutral context and was conducted by assistants uninformed about the goal and hypothesis. Participants received all instructions and tasks in a leaflet, and were instructed to proceed page-by-page, only when prompted. Generic instructions were also announced by the assistants. Each session involved only one of the treatments, and participants were randomly assigned to a session.

The experiment employed three treatments and unfolded in two stages. The first treatment, henceforth *baseline treatment*, lacked any manipulations. The second, henceforth *inequity treatment*, included the inequity manipulation. The third, henceforth *punishment treatment*, included the inequity and the punishment manipulations. In stage one, participants did not know about the subsequent stage two.

The goal of stage one was for participants to learn their role in the experiment, generate income, and to state their risk attitude by filling out the low-payment version of the Holt & Laury (2002) survey. For us, the goal of this stage was to establish the inequity manipulation in the two experimental

treatments (i.e., inequity and punishment). In the baseline treatment everyone was assigned the role of the *group member* and participants were pooled into a group of ten. In the inequity and punishment treatments, one subject was anonymously and randomly assigned to the role of the *piece-rate decider*, and the others (always ten participants per treatment) were assigned to the role of group member.

Group members generated their stage one income by answering a ten-item trivia (i.e., knowledge) quiz. Each correctly-answered quiz question yielded a piece-rate which was unknown to group-members until the end of stage one. These spanned subjects such as history, math, chemistry, etc. The rationale for earned income versus a simple endowment was to hopefully strengthen their sense of entitlement to or ownership of the earned money (for similar arguments see, for example, Falk & Fischbacher, 2002; Gächter & Riedl, 2005). The piece-rate decider in the two experimental treatments generated his/her income by implementing the inequity manipulation.

In the two experimental treatments, the inequity manipulation was implemented by the piece-rate decider. S/he was given the choice of assigning either a low (i.e., 100 HUF)[5] or a high (i.e., 500 HUF) piece-rate for each trivia question answered correctly by the group members. His/her incentives were misaligned, such that for selecting the low piece-rate s/he would be paid 2000 HUF, versus only 100 HUF for the high piece-rate. At the end of the first stage, group members learned the piece-rate chosen by the decider for each correct answer. Note that, in order to keep the piece-rate equal between treatments, sessions of the baseline treatment were conducted last.

Stage two measured compliance behavior in an income-reporting game with no redistribution, and elicited incentivized beliefs about the mean group compliance. These elicited beliefs were proxies for perceived social norms pertaining to the compliance situation. In addition, the punishment manipulation in the

[5]HUF=Hungarian Forints. One USD was approximately 270 HUF at the time of the experiment.

punishment treatment was established in this stage.

3.1. Procedure

Upon arrival in the laboratory, participants were seated in cubicles. After signing the consent form and receiving the show-up fee of 300 HUF, the experiment began. At the start of the first stage, in the inequity and the punishment treatments, one participant was randomly and anonymously assigned to the role of piece-rate decider. All other participants, i.e., the group members, were pooled into a group of ten (as were all ten participants in baseline treatment sessions, where there was no decider). Each subject privately learned his/her role — whether piece-rate decider or group member — from the leaflet initially handed out by the experimental staff.

In stage one, group members in all treatments were given a ten-item trivia quiz. They knew they would be paid per correct answer but did not yet know the actual piece-rate nor how it would be determined. In the meantime, in the two experimental treatments, the piece-rate decider was given the piece-rate choice along with some time-filling tasks.[6]

When the tasks were completed, assistants collected all sheets and determined the correct number of trivia answers, the earnings for each participant and the total group earning, while participants completed the Holt and Laury test. They were informed that one of their choices on this test would be randomly selected and played at the end of the experiment, for which they would be paid accordingly.

At the end of stage one, group members privately learned their quiz performance (i.e., number of correct answers), the piece-rate, their personal earnings (I_{gm}, number of items correct times piece-rate) and the total group income ($\sum_{gm=1}^{N} I_{gm}$), and were also reminded of the number of members of their group

[6] In order to make the piece-rate decider impossible to identify, all participants received experimental materials with the same apparent layout, and task duration was kept constant across roles.

($N = 10$). In the inequity and the punishment treatments, it was disclosed that the piece-rate was assigned by the piece-rate decider. However, the piece-rate decider's incentive schema (i.e., earning 20 times more for choosing the low piece-rate) was undisclosed so that group members did not have a rationale and justification for the distributive injustice. In all treatments it was emphasized that every group member received the same piece-rate and that income information is private. Due to the common piece-rate, income differences within a group were due solely to differences in trivia-quiz performance. The piece-rate decider also received a sheet confirming his payment for his piece-rate choice. This stage concluded with a manipulation check: a several-item survey about participants' satisfaction with their earnings and perception of fairness of the piece-rate determination.

At the beginning of the second stage, all participants were prompted to declare their stage one income, and to state their beliefs about the mean income proportion which would be declared by the group (excluding piece-rate decider's declaration).[7] This beliefs-elicitation procedure was incentivized such that those whose estimates were within 10% of the actual number received an extra payment of 1000 HUF; those between 10.1% and 15% received an extra 500 HUF; and those between 15.1% and 20% were given an extra 300 HUF at the end of the experiment.

Participants were told that 25% of the declared amount (D_{gm}) would be deducted, and the remainder paid in cash at the end of the experiment. Moreover, they learned that everyone was facing a 15% chance of being checked on his/her income-declaration. In the event that under-declaration is found, 50% of the undeclared amount is deducted from the true income. They were assured that other participants would not be aware if they were checked, nor of the outcome.

Subjects were also told that a 40% or lower mean declared-to-actual income ratio is considered *low*. In the punishment treatment, they were told that a low

[7] Eliciting beliefs when prompting behavior is similar to Croson (2007); Fischbacher et al. (2001); Tyran & Feld (2006).

ratio would cause one-fourth of the piece-rate decider's income to be retained. Here, we purposefully avoided using the word "punishment". Given the conditions of income declaration, the individual expected utility of a group member is $EU_{gm} = 0.85 \cdot U(I_{gm} - 0.25D_{gm}) + 0.15 \cdot U(I_{gm} - 0.25D_{gm} - 0.50(I_{gm} - D_{gm}))$.

While the assistants collected sheets with the declared income and the stated beliefs and prepared the individual payment sheets, subjects filled out a brief demographics survey, and a survey about their feelings about and behavioral motives in stage two. Finally, participants learned their final earnings and were paid in cash. Find English translation of the experimental material in the Supplementary Files.

3.2. Predictions

We generally expected decreased compliance and compromised beliefs about the prevailing norms after experiencing inequity. We also predicted that compliance type (i.e., zero, partial or full compliance) would depend on prior experience of distributive injustice.

We anticipated that risk aversion, beliefs and gender would also affect compliance level. Specifically, we predicted a positive association between the degree of risk aversion and compliance.

To formulate expectations about how risk preference influences compliance behavior, we rely on the functional specification of relative risk aversion (RRA) adopted from Holt & Laury (2002, 2005).[8] Accordingly, from a pure monetary perspective, zero compliance is the maximizing strategy for everyone given our experimental payoff structure. Note, however, that individual average marginal utility from decreasing compliance does depend on risk preference. Ceteris paribus, decreasing compliance yields the greatest marginal utility increase for risk seekers, and becomes almost negligible for the risk averse. Specific average marginal utilities for each risk preference type after pooling all treatments

[8] The utility function is defined as $U(x) = \frac{x^{1-r}}{1-r}$, where x is the monetary outcome, and r captures the individual degree of relative risk aversion.

together are: 2.14, 0.13 and 0.001 for risk seeker, risk neutral, and risk-averse participants, respectively.

We also predicted a positive association between beliefs and compliance in all treatments. In addition, we expected that males would comply less than females. When forming expectations about the role of beliefs in compensation seeking, we predicted that the decreased compliance after distributive injustice would be caused by a decrease in beliefs.

The punishment treatment introduced the issue of an indirect negative reciprocity. Beyond predicting a decrease in compliance when moving from inequity to punishment treatment, we specifically expected that compliance would be more likely to fall in this low zone in the punishment than in the inequity treatment.

3.3. Participants

We enrolled 128 participants in the experiment from various universities in Budapest, Hungary. There was no exclusion criteria to participate in this study. Eight of the 128 participants were assigned to the piece-rate decider role in the two experimental treatments However, since we had no intention of using the responses from participants in this role, the results which follow pertain only to the remaining 120 participants.

In each treatment we had 40 participants. Key demographics did not differ across treatments. Mean age in years was 22.45 (2.37), median income level was in the third-highest 25% of the Hungarian population, and median education level was high school graduate. In addition, 55% of participants were male.

4. Results

We first present descriptive results. Then, for a more in-depth analysis, we investigate the interplay between risk aversion, beliefs and gender in determining compliance level, and also view their relationship to compliance types. We then present results on the role of beliefs in compliance behavior. Next, we address

the issue of punishment. We conclude with some exploratory speculation about the nature of the punishment.

4.1. Descriptive results

In line with our intentions and previous survey results on the piece-rate decider's choice, in all experimental sessions the piece-rate decider selected the low rather than the high piece-rate. Hence, the piece-rate was 100 HUF in all treatments.

Checking whether the inequity manipulation worked, we first look at the mean stage 1 earnings in HUF, the mean satisfaction with them, and how fair participants rated the piece-rate determination was. The first row of Table 1 demonstrates that mean stage 1 earnings do not differ across treatments, but that mean satisfaction is indeed lower in the two experimental treatments than in the baseline (see row two). [9] In addition, everyone in the baseline treatment indicated that fairness was not an issue when determining the piece-rate, while 55% of participants in the inequity and 48% in the punishment treatments indicated that the piece-rate decision was unfair.

Insert Table 1 Here

Next, we determine compliance level as the proportion of declared and true income, ranging from 0 to 1. Although beliefs about mean group compliance level were elicited in percentages, we converted these numbers to ratios in $[0, 1]$. As row three of Table 1 shows, compliance is lower in the two experimental treatments than in the baseline. Row four shows that the same is true of beliefs.

The measure of risk aversion is the sum of the safe choices on the low-payment version of the Holt and Laury test (adapted to Hungarian currency). Following the protocol from Harrison et al. (2005), inconsistent participants (10% overall) were coded as risk neutrals. Turning again to Table 1, the last

[9] Most analysis, if not indicated otherwise, was conducted with SPSS 23 statistical package.

row shows that the degree of risk aversion does not differ between treatments.

Next, we classified participants into zero (compliance level equal to 0), partial (compliance level between 0 and 1) and full compliers (compliance level equal to 1). Results presented in Table 2 demonstrate that the distribution of compliance types is not independent from treatment, $\chi^2(4) = 12.67$, $p <= 0.01$.

Insert Table 2 Here

4.2. Decreased compliance

To specifically address how the experimental factors, risk aversion, gender and beliefs affect compliance behavior we conduct zero-and-one-inflated beta regressions (e.g., Ospina & Ferrari, 2010, 2012).

Our data are proportions which include many zeros and ones. Although commonly used in such settings, OLS is based on the necessarily false assumptions of linearity and homoscedasticity — unlike a line, the data are bounded to $[0, 1]$, and the variance must be lesser near the bounds. Tobit regression attempts to remedy this by assuming a latent variable which has been censored to $[0, 1]$, which is not the same as a variable which is only defined there (as ours is). Further, it assumes that the effects which, for example, drive someone to comply at all are the same as those which influence their choice of how much to comply. With inflated beta regression, however, we can also directly examine how our treatment manipulations, beliefs and moderators (i.e., gender and degree of risk aversion) influence the prevalence of the three behavior types of zero, partial and full compliance, as well as the mean compliance level for partial compliers. The overall conditional distribution of compliance is modeled as a mixture of two discrete and one continuous portion. The former two comprise the log odds of non-versus-partial compliers (ν) and of full-versus-partial compliers (τ), while the latter is the beta portion, modeling the distribution of partial compliers within $(0, 1)$, and parametrized by its mean (μ) and dispersion (σ). (Find robustness checks presenting results of OLS with standard robust

estimates as well as Tobit regressions leading to consistent but less detailed results in Appendix A.)

Table 3 summarizes the results of these regressions on the two experimental factors, also controlling for gender and risk aversion (model I), and also for beliefs (model II).[10] Our primary interest is in the μ equation, modeling compliance level for partial compliers, presented in the first column. From model I, we see that among those who partially comply, experiencing inequity and the opportunity to punish act to lower mean compliance, while increase in risk aversion is associated with increased mean compliance. Adding beliefs (model II), one can see that the effect of inequity disappears, while the effect of punishment remains, and that beliefs are positively associated with compliance. This behavior of beliefs, echoed in the ν and τ equations which follow, suggests that beliefs may be mediating the inequity effect, which we will formally test below. The positive association between the degree of risk aversion and compliance remains, and neither model detects a gender effect on mean compliance for partial compliers.

The second column of this table shows results of the σ equations for both models.[11] As one can see from model I, dispersion of compliance increases in the punishment treatment. This effect remains after adding beliefs (model II), while dispersion is not significantly associated with beliefs.

The third column, the ν equations, demonstrate that before controlling for beliefs (model I) inequity increases the odds of being a zero over a partial complier, while punishment, risk aversion and gender are also not significantly associated with these odds. As above, this effect of inequity disappears after adding beliefs (model II), however. Here we see that an increase in beliefs is negatively

[10] Analyses were conducted using GNU R 3.3.1 (R Core Team (2016)), with packages `betareg` (Cribari-Neto & Zeileis (2009)) for the plain beta regression, and `gamlss` (Rigby & Stasinopoulos (2005)) for the zero-one inflated beta regression.

[11] We are not interested in (nor did we have any predictions about) how the treatments would affect dispersion per se. We will, however, see that the treatments did affect beliefs, and so this specification will be most appropriate for the mediation analysis below.

associated with the odds of being a zero over a partial complier.

Moving to the τ equations, the presence of inequity in model I makes full versus partial compliance less likely, whereas we find no effect of punishment, gender and risk aversion. After adding beliefs (model II), the effect of inequity again disappears, while increased beliefs are positively associated with the relative odds of full compliance.

Insert Table 3 Here

As predicted, beliefs are lower after experiencing inequity, and beliefs are associated with compliance type. To determine the degree to which the effects of inequity and punishment upon compliance are mediated by beliefs, we employ the parametric bootstrap method of causal mediation analysis from Imai et al. (2010). First, to model beliefs, we use an ordinary (i.e., noninflated) beta regression because only one participant reported 1 for his beliefs, and none reported 0. This yields two equations: the mean μ of the beta distribution with coefficients on the logit scale, and the precision ϕ with coefficients on the log scale.[12] Corresponding to the compliance model above, we use the experimental factors, gender, and risk attitude in the equation for the mean beliefs, and only the experimental factors predicting the dispersion.

Table 4 summarizes the model of beliefs. From the first equation, μ, one can see that experiencing inequity is associated with decreased mean beliefs whereas punishment has no apparent effect on the mean beliefs. Neither gender nor degree of risk aversion seem to influence beliefs. From the second equation, ϕ, one can see that both of the experimental factors do lead to a decrease in precision (i.e., an increase in dispersion) of beliefs.

[12] Note, this is instead of dispersion σ modeled on the logit scale as in Table 3, due to differences in the software packages used to do the two regressions. An increase in precision is associated with a decrease in dispersion, related by $\phi = 1 - \sigma^2/\sigma^2$. We retain the precision in this table due to difficulties in converting standard error estimates on the different scales.

Insert Table 4 Here

The mediation analysis shows that, after controlling for risk aversion and gender, the effect of inequity on compliance is entirely due to its reduction of beliefs (i.e., full mediation). This indirect effect amounted, on average, to a reduction of 0.20 in compliance (95% CI [-0.31; -0.11]). Whereas any remaining direct effect of inequity was indistinguishable from zero (95% CI [-0.23; 0.03]) and the proportion mediated was indistinguishable from 1 (mean 0.67, 95% CI [0.46, 1.00]). We found no corresponding mediation of punishment by beliefs (95% CI for average effect [-0.11; 0.15]), which is unsurprising, given that this factor seemed only to increase the dispersion of beliefs, rather than change their location.

4.3. Punishing the wrongdoer

Now we investigate whether compliance was more likely to fall into the "low zone" in the punishment treatment, where this could inflict financial harm on the wrongdoer. Thus, we created a low-zone indicator variable (1 - compliance is less than equal to 40%, 0 - otherwise). Restricting the sample to the inequity and punishment treatments, we first regress this variable on the experimental factors, controlling again for beliefs, risk aversion and gender. Then, we further restrict the sample to risk-averse participants because among everyone, risk-averse people would be the least likely to comply in this lowest zone. This is because, they derive almost zero marginal utility from decreasing compliance.

Results from these regressions are summarized in Table 5. From models I and II we see that the likelihood of complying within the lowest zone is higher in the punishment treatment. Again, an increase in beliefs and in risk aversion is associated with a lower probability of complying in this lowest zone, while we no found effect of gender. Model III presents results on the restricted sample of risk averse participants. One can see that, even for this most risk averse subset, the likelihood of complying in the lowest zone increases in the punishment

treatment.

Insert Table 5 Here

Now we turn to speculating about the nature of this punishment. We intuit that, insofar as lowest zone compliance involves a deviation from beliefs, the cost of this deviation reduces or even cancels out the marginal monetary gain of low compliance. One testable implication of this would be that people in the punishment treatment should be more likely to deviate from their beliefs in order to punish. To test this we further restrict the sample to those who believe the group mean will be above the lowest zone, and consider the proportions among them who nevertheless comply within the lowest zone, below their beliefs. We would expect the proportion of such people to be higher among the punishment than the inequity treatment. In our sample, the respective proportions are 0.29 and 0.13. The difference falls short of significance (z=-1.34, p=0.18), possibly due to the small sizes of the restricted samples (23 and 28, respectively) and the relatively low power of the binomial test of proportions.[13] Thus, these results are strictly exploratory and speculative.

5. Discussion

Our findings highlight the importance of history in economic behavior. In the aftermath of a shared experience of distributive injustice, rather than taking a future-looking perspective, people formed eroded beliefs about the norms which led them to seek compensation, even from a party unrelated to their loss. Because beliefs about norms were already eroded, people did not need to suffer the discomfort of violating perceived norms.

This loop is obviously detrimental — it turns non-compliance with a neutral third party into a norm. In this way, the ability of a new party to rehabilitate

[13] If the reported proportions were true, then this test at $\alpha = 0.05$ would only detect a difference between samples of the given size 30% of the time.

or reintegrate the group is severely hampered, since the damaged norms are already in place. By such a mechanism, for instance, employees may sabotage their company just because their immediate boss mistreated them, leading them to suspect that everyone is probably a saboteur in response. Or, new leaders of affronted nations or countries may face hardships in compliance with tax paying or other duties, just because the wronged people bring already corrupted norms. This may hinder restoration of institutions and promote unethical behavior.

Furthermore, the fact that some self-appointed revenge-takers were willing to go below their already eroded norms in order to inflict punishment, indicates that some people are willing to pay a psychological price in order to take revenge. This may be particularly alarming because, in repeated situations, these outliers can significantly corrupt norms, which then may lead to the norm of retaliatory behavior. Although our framework did not allow us to determine the cost of deviating from beliefs, we speculated that this psychological cost may decrease or perhaps even offset the monetary benefit of decreased compliance. At the same time however, in our view this punishment lacks any positive potential. Unlike altruistic punishment in public good games (where it elicits and maintains cooperation) or in an ultimatum game (where it reminds the offering party of some tacit fairness norm), the punishment in our case is purely deleterious for the group. On one hand, it further corrupts norms, again impeding consolidation; and on the other hand, it violates the self-image of the perpetrator, who may perceive himself as someone who easily deviates from his beliefs about normative behavior.

An understanding of the role of beliefs in compensation-seeking and negative reciprocity may shed light on why some people do not feel discomfort when pursuing an unethical act. We assume that if people's compromised beliefs about the norm motivate an unethical behavior, then there is no countervailing, deterrent force of guilt or shame. Even in cases where the discomfort of unethical behavior causes most people to refrain, if a critical number of people engage in the behavior, it may cause people to believe that the behavior is the new norm, thus removing the deterrent.

6. Conclusions

We conclude that letting bygones be bygones and forming optimistic beliefs about others' behavior may be crucial elements of recovery for wronged groups. This may promote reintegration and thus facilitate rebuilding mutual trust, cooperation and the norm of compliance in the affronted, which is crucial for a thriving recovery in the aftermath of a loss.

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Appendices: Additional Analysis

Appendix A. Robustness checks

Here we provide robustness checks for results presented in Table 3 of the manuscript. Table A1 presents results of an OLS (with robust standard error estimates) of compliance on the experimental factors controlling for risk aversion and gender (model I) and then adding beliefs (model II). As one can see from this table, experiencing inequity significantly decreases compliance before and after controlling for beliefs. Unlike in Table 3 where the effect of inequity disappears after adding beliefs, here we see that when pooling all compliance types together, the effect of inequity remains after adding beliefs. In addition, in both models we find that average compliance is lesser for males than for females, and that, and increase in risk aversion is associated to increase in compliance.

Table A1: Summary of regressing (OLS with standard robust errors) compliance on experimental factors while controlling risk aversion and gender (model I) and beliefs (model II).

	I	**II**
intercept	0.76(0.10)***	0.19(0.11)+
inequity=1	−0.30(0.06)***	−0.14(0.06)***
punishment=1	−0.05(0.08)	−0.08(0.06)
sum of safe choices	0.03(0.02)***	0.02(0.01)**
male	−0.13(0.06)**	−0.12(0.50)**
beliefs		0.92(0.10)***
LR χ^2	29.34***	92.87***
df	4	5
N	140	140

Note, standard errors are in parentheses.

***$p <= 0.001$, **$p <= 0.01$, *$p <= 0.05$, +$p <= 0.1$

We also conducted a Tobit regression with the same two model specifications, with results summarized in TableA2. In model I, compliance decreases after experiencing inequity and it is lower for males than for females. Adding

beliefs to the model (II), the effect of inequity almost disappears and the strong association between beliefs and compliance is clear. We find no significant effect of risk aversion in either model.

Table A2: Summary of Tobit regressions of compliance on experimental factors while controlling for risk aversion and gender (model I) and beliefs (model II).

	I	**II**
intercept	1.18(0.26)***	−0.05(0.23)
inequity=1	−0.64(0.17)***	−0.25(0.13)+
punishment=1	−0.05(0.16)	−0.12(0.12)
sum of safe choices	0.04(0.04)	0.02(0.03)
male	−0.29(0.14)∗	−0.23(0.10)*
beliefs		0.92(0.10)***
Log-likelihood	-108.28	-81.29
df	234	233
N	140	140

Note, standard errors are in parentheses.

***$p <= 0.001$, **$p <= 0.01$, *$p <= 0.05$, +$p <= 0.1$

Appendix B. Exit survey

In Table A3 we present responses on the exit survey, which had three questions on participants' feelings, and four questions, conditional on treatment, about their motivations, strategies and fairness perceptions. Because, however, we had no specific predictions about these responses and their credibility is also dubious (i.e., whether they reflect truly experienced feelings and motivations or just some kind strategic self-impression management), we only report them in the appendix.

Regarding feelings, participants in the two experimental treatments feel more angry and disappointed than those in the compliance treatment. Satisfaction with earnings is also higher in the baseline than in the two experimental treatments.

Responses on the second cluster of questions should be considered cautiously, since they may simply be post hoc justifications of experimental behavior or attempts to maintain a positive self-image. Reservations notwithstanding, we see that the reported ethicality of behavior, and the agreement about the fairness of under-reporting income did not differ between treatments. There was also no difference between the two experimental treatments on how much they believed under-declaration is a way to compensate low piece-rate. The last row presents mean response on the motivation to retaliate for the low piece-rate in the punishment treatment.

Table A3: Means and 95% CIs of exit survey responses in the three treatments

	Baseline		**Inequity**		**Punishment**	
	mean (SD)	95% CI	mean (SD)	95% CI	mean (SD)	95% CI
1. I am angry	1.13 (0.40)	[1.00; 1.25]	1.83 (1.04)	[1.49; 2.16]	1.73 (0.91)	[1.44; 2.01]
2. I am disappointed	1.55 (0.85)	[1.28; 1.82]	2.53 (1.18)	[2.15; 2.90]	2.15 (1.03)	[1.82; 2.48]
3. I am satisfied with my earnings	3.10 (0.78)	[2.85; 3.35]	2.48 (0.88)	[2.19; 2.76]	2.50 (0.88)	[2.22; 2.78]
4. I declared my income ethically	3.08 (1.19)	[2.70; 3.45]	2.38 (1.23)	[1.99; 2.78]	2.38 (1.30)	[1.96; 2.79]
5. I believe it is fair to declare less income than true income	1.73 (0.85)	[1.45; 2.00]	1.83 (0.81)	[1.57; 2.08]	2.20 (1.14)	[1.84; 2.56]
6. I believe income declaration was an opportunity to compensate low piece-rate	NA		2.55 (0.96)	[2.24; 2.86]	2.58 (1.17)	[2.20; 2.95]
7. When I declared my income I wanted to retaliate on the piece-rate decider for assigning the low piece-rate	NA			NA	2.23 (1.19)	[1.85; 2.60]

Note, responses were recorded on a four-level Likert scale: 1- absolutely not agree, 2 - little bit agree, 3 - moderately agree, 4 - strongly agree.

Table 1: Key descriptive results in the three treatments.

	Baseline		**Inequity**		**Punishment**	
	mean (SD)	95% CI	mean (SD)	95% CI	mean (SD)	95% CI
stage 1 earnings (HUF)	700.0(119.83)	[661.68; 738.32]	707.50(118.51)	[669.60; 745.40]	705.00(121.85)	[666.03; 743.97]
satisfaction with stage 1 earnings	3.05(0.78)	[2.80; 3.30]	2.13(0.88)	[1.84; 2.41]	2.25(0.84)	[1.98; 2.52]
compliance level	0.86(0.22)	[0.79; 0.94]	0.56(0.38)	[0.44; 0.69]	0.52(0.41)	[0.39; 0.65]
beliefs about mean group compliance	0.67(0.17)	[0.62; 0.73]	0.50(0.25)	[0.43; 0.58]	0.53(0.27)	[0.45; 0.62]
sum of safe choices	5.30(2.00)	[4.66; 5.94]	5.15(1.63)	[4.63; 5.67]	4.80(1.59)	[4.29; 5.31]

Table 2: Compliance types in the three treatments.

		Baseline	**Inequity**	**Punishment**
zero complier	N	1	9	9
	%	2.50%	22.50%	22.50%
partial complier	N	15	19	18
	%	37.50%	47.50%	45.00%
full complier	N	24	12	13
	%	60.00%	30.00%	32.50%
Total	N	40	40	40
	%	100.00%	100.00%	100.00%

Table 3: Summary of zero-one inflated beta regressions on compliance

	μ **(beta mean)**		σ **(dispersion)**		ν **(zero compliance)**		τ **(full compliance)**	
	I	**II**	**I**	**II**	**I**	**II**	**I**	**II**
intercept	−0.13(0.38)	−1.08(0.50)∗	−0.65(0.24)∗∗	−0.79(0.60)	−2.11(1.41)	3.51(2.07)+	1.43(0.77)	−0.74(1.07)
inequity=1	−0.54(0.23)∗	−0.36(0.24)	−0.48(0.32)	−0.42(0.34)	1.99(1.12)+	0.69(1.32)	−0.99(0.50)+	−0.73(0.52)
punishment=1	−0.43(0.22)+	−0.45(0.23)∗	0.77(0.29)∗	0.57(0.33)+	0.05(0.59)	−0.02(0.79)	0.06(0.52)	−0.20(0.57)
sum of safe choices	0.19(0.05)∗∗∗	0.20(0.05)∗∗∗			−0.20(0.17)	−0.33(0.24)	−0.06(0.12)	−0.11(0.13)
male	−0.11(0.19)	−0.15(0.18)			0.60(0.58)	0.48(0.79)	−0.56(0.42)	−0.74(0.45)
beliefs		1.41(0.52)∗∗		0.11(0.89)		−10.67(2.86)∗∗∗		3.34(1.24)∗∗

Note, standard errors are in parentheses., Coefficients are on the log odds scale for the μ and σ equations, and on the log scale for the ν and τ equations.

$^{***}p <= 0.001$, $^{**}p <= 0.01$, $^{*}p <= 0.05$, $+p <= 0.1$

Table 4: Mediator model (beliefs)

	μ**(beta-mean)**	ϕ**(precision)**
intercept	0.39(0.28)	2.12(0.21)***
inequity=1	−0.68(0.18)***	−0.91(0.29)***
punishment=1	0.40(0.25)	−0.96(0.27)***
sum of safe choices	0.04(0.04)	
male	0.16(0.16)	
N	140	140

Note, standard errors are in parentheses.

***$p <= 0.001$, **$p <= 0.01$, *$p <= 0.05$, +$p <= 0.1$

Table 5: Summary of binary logistic regressions (logit link function) of compliance in the lowest zone

	I	**II**	**III**
intercept	6.37(1.87)***	6.37(1.76)***	1.12(0.99)
punishment=1	1.39(0.72)*	1.39(0.72)*	2.56(1.50)+
beliefs	−8.25(1.88)***	−8.25(1.84)***	−8.75(3.19)**
sum of safe choices	−0.74(0.27)**	−0.74(0.27)**	
male	0.01(0.68)		
LR χ^2	50.08***	50.08***	18.02***
df	4	3	2
N	80	80	33

Note, Standard errors are in parentheses. Coefficients on are on the log odds scale.

***$p <= 0.001$, **$p <= 0.01$, *$p <= 0.05$, +$p <= 0.1$

Experimental Material

Prior to experiment
Everyone

Welcome to our experiment on Financial Decisions and thanks for coming.
In this experiment you will be asked to make financial decisions. The experiment is anonymous, your decisions and payoffs cannot be linked to your identity.
The assistants with whom you will be interacting during the experiment are uninformed about the goals and the hypothesis of the experiment.
In addition, there is no deception in this experiment, everything happens as we tell you and you earn as much as you are told. You will be paid in cash at the end of the experiment.

Only in baseline treatment:
There are ten people in this room, and they belong to the same group. They are called group member.

Only in inequity and punishment treatments:
There are eleven people in this room and one of you will randomly selected to take the decision-maker role. The remaining 10 people will belong to the group, and will be called group member.

Everyone
Everyone will get a **300 HUF show up fee**. Your further earnings depend on your decisions.
The mean expected is 1600 HUF (beyond the show-up fee).
You can always discontinue your participation. In this case you would only be paid the 300 HUF show up fee.

The experiment will last for approximately 35 minutes during which you are only allowed to talk to the staff.
You receive all instructions on paper in the experimental leaflet and we will also read out some instructions.
Furthermore, you are only allowed to turn a page in the leaflet when we instruct you to do so.

After you consented to participate you will receive the 300 HUF show up fee.

1) I am older than age 18
❑ Yes
❑ No
2) I have read and understood the brief description of the experiment
❑ Yes
❑ No
3) I would like to participate in the experiment
❑ Yes
❑ No

Date and sign:

.....

Experimental Material

page 1 **ID:**

Inequity and punishment treatments
For group members:
You are selected to be a group member.

baseline, inequity and punishment treatments:
For group members:
Now you will be working on a ten item trivia quiz and will be paid based on your performance. The other group members are also working on the same ten-item trivia quiz and will also be paid based on their performance.

In the table at the bottom of this page please indicate your answers for each question. If, for instance, you selected D for question 1 write D in the box below 1 in the table. When you are done please tear this page out, turn it facing down and the experimenters will go and collect them.

Ten Trivia questions with four answer choices come here.
E.g.: Which Hungarian poet died in the 1848 freedom-war?
A. Petőfi Sándor, B. Babits Mihály, C. Vörösmarty Mihály, D. József Attila

1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**	**10.**

For decision-maker in inequity and punishment treatments:
You are selected to be a decision-maker. While the group-members are working on a ten-item trivia quiz you have to decide their piece-rate for each correct answer.
You have two options:
Option A: Each correct answer pays 500 HUF for the group members and I am paid 100 HUF for making this decision.
Option B: Each correct answer pays 100 HUF for the group members and I am paid 2000 HUF for making this decision.

My choice:
- ❑ Option A
- ❑ Optoin B

In the table at the bottom of this page please indicate your answers for each question. If, for instance, you selected D for question 1 write D in the box below 1 in the table. When you are done please tear this page out, turn it facing down and the experimenters will go and collect them.

Nine filling questions with four answer choices come here.
E.g., Indicate your preference between plain jourt and kefir.
A. plain joghurt, B. Kefir, C. I like them equally

1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**

Raise your hands if you any questions.

Page 2 **ID:**

Please wait now and do not turn a page.
Look ahead so that we know you are ready.
Once everyone is ready we instruct you to turn a page.

Page 3 **ID:**

For everyone in all treatments

Risky Decisions

In the table below you find ten risky financial decisions. In all decisions you can choose between options A and B and in the last column please indicate your choice.

At the end of the experiment the computer will randomly draw one of the listed ten choices and you will be paid on this choice. If, for instance, the first choice will be drawn and you chose option A then you will paid 500 currency with 10% and 400 currency with 90%. If you selected option B here, then you will be paid 965 currency with 10% and 25 currency with 90%.

Once you made all your choices tear this page out, place it facing down on your table and the experimenters will collect them. Please do not turn a page until we instruct you to do so.

	Option A				**Option B**				**My choice: A or B?**
	Prize in HUF	Likelihood	Prize in HUF	Likelihood	Prize in HUF	Likelihood	Prize in HUF	Likelihood	
1	500	10%	400	90%	965	10%	25	90%	
2	500	20%	400	80%	965	20%	25	80%	
3	500	30%	400	70%	965	30%	25	70%	
4	500	40%	400	60%	965	40%	25	60%	
5	500	50%	400	50%	965	50%	25	50%	
6	500	60%	400	40%	965	60%	25	40%	
7	500	70%	400	30%	965	70%	25	30%	
8	500	80%	400	20%	965	80%	25	20%	
9	500	90%	400	10%	965	90%	25	10%	
10	500	100%	400	0%	965	100%	25	0%	

OR

OR

Page 4 **ID:**

Please wait and do not turn a page.
Look ahead so we know that you are ready.
You will soon find out how much money you made.

Page 5 **ID:**

For group members in all treatments
You made ..... correct answers on the trivia quiz. The piece-rate is 100 HUF for each correct answer.
Only in inequity and punishment treatments
The piece-rate for every group member that was selected by the decision-maker is 100/500 HUF.
Note that the decision-maker selected this 100/500 HUF piece-rate from a set of 100 HUF and 500 HUF piece-rates.
Also note that everyone within the group was assigned to the same 100/500 HUF piece-rate.
For group members in all treatments

Based on the piece-rate and your correct number of trivia, your earnings are..... HUF.
You will be paid in cash at the end of the experiment.

PLEASE NOTE THAT THIS IS A PRIVATE INFORMATION. THE EXPERIMENTERS CANNOT ASSIGN YOUR PRIVATE EARNINGS TO YOUR IDENTITY. TEAR THIS SLIP OUT, AND PUT IT INTO YOUR POCKET OR IN YOUR BAG.

Also note that the total group earnings on the trivia were .....HUF and there are 10 people in the group.

For decision-maker in inequity and punishment treatments
You made ..... HUF with your piece-rate allocation choice.
You will be paid in cash at the end of the experiment.

PLEASE NOTE THAT THIS IS A PRIVATE INFORMATION. THE EXPERIMENTERS CANNOT ASSIGN YOUR PRIVATE EARNINGS TO YOUR IDENTITY. TEAR THIS SLIP OUT, AND PUT IT INTO YOUR POCKET OR IN YOUR BAG.

Also note that the total group earnings on the trivia were .....HUF and there are 10 people in the group.

Page 6 **ID:**

Now, please answer the following questions.

Everyone in all treatments

1. How satisfied are you with your earnings?
   - ❑ Not at all
   - ❑ Little bit
   - ❑ Moderately
   - ❑ Very much
2. Do you have plans about how you will spend your earnings?
   - ❑ I earned so little that I have no plans
   - ❑ Yes. I will spend it on ...
3. Would you say that the piece-rate decision was ...
   - ❑ Fair
   - ❑ Rather fair
   - ❑ Rather unfair
   - ❑ Unfair
   - ❑ Fairness was not an issue here

Only for group members in inequity and punishment treatments

4. *I am angry with the piece-rate decision*
   - ❑ *Not at all*
   - ❑ *Little bit*
   - ❑ *Moderately*
   - ❑ *Very much*
5. *I am disappointed by the piece-rate decision*
   - ❑ *Not at all*
   - ❑ *Little bit*
   - ❑ *Moderately*
   - ❑ *Very much*

Page 7 **ID:**

Everyone in all treatments:
Now, please declare your privately learned income on the field below. Everyone, including the piece-rate decider declares his/her income.
25% of your declared income will be deducted from your final earnings, and the remaining amount will be paid in cash. Any non- declared income is not subject to the 25% deduction. You can declare any numbers between 0 HUF and your true income. You cannot declare more you made.
The mean declared and true income ratio will be determined in your group. NOTE THE PIECE-RATE DECIDERS DECLARED INCOME WILL NOT BE COUNTED TOWARDS THIS RATIO. NEITHER INTO THE TOTAL GROUP-TRUE INCOME.
40% or less mean group declared income is considered as low{*only in punishment treatment*: In this case the piece-rate decider will be punished by deducting 25% from his earnings so far}.

Furthermore, everyone (including the piece-rate decider) faces a 15% of being checked whether she/he declared his/her true income. If she/he found under-declaring, 25% of the undeclared amount will be deducted two times from his/her earnings. Note, however, the identity of these people will not made public information.

Furthermore, please estimate the ratio of the mean declared and true income ONLY AMONG GROUP MEMBERS. THAT IS, EXCLUDE HOW MUCH YOU BELIEVE THE PIECE-RATE DECIDER DECLARES.
In the field below indicate a number between 0% and 100% that best describes your estimation. If your estimation falls within plus/minus 10% of the actual ratio, you will be paid an extra 1000 HUF in addition to your earnings. If your estimation falls within plus/minus 10.1% and 15% of the actual ratio, you will be paid an extra 500 HUF in addition to your earnings. If your estimation falls between 15.1% and 20% an extra 300 HUF in addition to your earnings.

I made ..... HUF on the trivia quiz*{for piece-rate decider:* **on my piece-rate choice}.**

My best estimate for the mean declared and true income ratio <u>in my group</u> is .....%. *{for piece-rate decider:* **<u>in the group</u>}.**
(Please, only indicate an integer.)

Please raise your hand if you have any questions. We will go to your desk to answer your questions.
Otherwise, complete the task.
Once you are done please tear out this page, and place it facing down on the corner of your desk.

Page 8 **ID:**

While the assistants process the income declarations and estimations, please fill out the demographics survey. Please do not turn page when you are done with this survey. Once everyone is done we will disclose results of processing the declared income.

1) Year of your birth:
2) Your gender:
   - ❑ Male
   - ❑ Female
3) Your highest level of education
   - ❑ Elementary school
   - ❑ High school graduate
   - ❑ BA or college
   - ❑ MA or university
   - ❑ PhD
   - ❑ Other, please specify
4) Are you a currently enrolled student?
   - ❑ Yes
   - ❑ No
   - ❑ On hold
   - ❑ Other, please specify
5) Specify the field of your studies ….
6) How would you rate income (your family if you are living at home, your own if you are living on your own)? If you or your family earns income outside of Hungary please think of that county.
   - ❑ Lowest 25%
   - ❑ Second 25%
   - ❑ Third 25%
   - ❑ Highest 25%
7) Your employment situation (you can indicate more than one):
   - ❑ Full-time
   - ❑ Part-time
   - ❑ Self-employed
   - ❑ Retried
   - ❑ Other, please specify…
8) Your living place:
   - ❑ Budapest
   - ❑ Capital of a province
   - ❑ Small town
   - ❑ Village
   - ❑ Other, please specify

Page 9 **ID:**

1) In a few sentences please share with us that what situation the experiment the most reminded you? We are mostly interested what real life parallels you find …
2) In a few sentences please summarize your motivations (thoughts, feelings, etc.) when declared your income.
3) Please rate the following statements:

	Absolutely do not agree	Little bit agree	Moderately agree	Very much agree
I am angry				
I am disappointed				
I declared my income ethically				
I believe it is fair to declare less than true income				
I am satisfied with my income				
Only in inequity and punishment treatments: I believe declaring less than true income is a way to compensate for the low piece-rate				
Only in punishment treatment: When declaring my income I wanted to take revenge on the piece-rate decider for assigning the low piece-rate.				

Page 10 **ID:**

For group members in all treatments
In total you made ….. HUF on this experiment.
Your total payment is composed of the following items:

- You earned …. HUF on the trivia quiz after the deduction.
- You were checked/not checked and fined to …… HUF
- You made 1000/500/300/0 HUF in estimating the mean declared and true income ration in your group
- You made ….. HUF on the risky decisions survey

For piece-rate decider
In total you made ….. HUF on this experiment.
Your total payment is composed of the following items:

- You earned ……. HUF on the piece-rate allocation task after the deduction.
- You were checked/not checked and fined to ……. HUF.
- You made 1000/500/300/0 HUF in estimating the mean declared and true income ration in the group
- You made ….. HUF on the risky decisions survey

Please, put this page into the leaflet and write down your total earnings on your experimental ID on the sticky note.

Once you are ready leave the leaflet on the table, take your sticky note to the next room where you get paid. Please do not tell what happened in this experiment to anyone since we are collecting data in the whole semester.

THANK YOU FOR YOUR PARTICIPATION.