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Market mindset impacts moral decisions: The exposure to market relationships makes moral choices more utilitarian by means of proportional thinking

Abstract

We show that exposure to market relationships increases people's tendency to make utilitarian moral choices by means of proportional thinking—the definitional feature of the market mindset. In Experiment 1, participants primed with market relationships made more utilitarian choices in both the trolley and the footbridge dilemmas. In Experiment 2, priming market mindset led to more utilitarian moral choices and to greater focus on the proportion of survivors to victims. Experiment 3 showed that the effect of market mindset on utilitarian choices held only when the numbers of potential deaths and saved lives were clearly specified. A preregistered Experiment 4 demonstrated that the motivation to use proportional thinking mediates the relationship between market mindset and making utilitarian choices. Experiment 5, also preregistered, showed that the main effect we demonstrated is not due to suppressed emotions and that proportional thinking increases utilitarian choices as part of a broader orientation on rationality.

Keywords: market mindset, proportional thinking, utilitarian choices, moral choices

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The contemporary world in which we live is characterized by an increasing prevalence of market-like practices and by a growing tendency to perceive social relations through market-oriented lenses (Bauman, 2007; Kasser, 2016; Kasser et al., 2007; Sandel, 2012; Stanfield & Stanfield, 1997). In other words, more often and more easily than in prior times, people tend to define and construe relationships in which they engage as if they represented business or trade. This tendency is visible not only in relations with strangers, but also in interactions with close others. For example, Halawa and Olcon-Kubicka (2018) showed in their ethnographic fieldwork that some people use business-like practices to regulate their family's daily lives, for example, by creating homemade accounting and budgeting spreadsheets. These serve not only to provide reasonable family budgeting, but also—and especially—to keep track of their spouse's contribution toward household expenditures.

Previous research (Falk & Szech, 2013) showed that the prevalence of market mentality could impact peoples' moral choices, as participants were more willing to trade the life of a real mouse for a monetary gain when participating in a bilateral or multilateral market exchange, compared to individual decision condition. In the present paper, we show that moral decision-making can be affected not only by participating in an actual market exchange, but also as a consequence of merely activating the market mindset. We report results of five experimental studies consistently indicating that people employ more utilitarian decision-making strategies while solving moral dilemmas when they are reminded of market relations. We also suggest that such a shift towards utilitarianism in moral reasoning results from the fact that thinking in terms of the market mindset is based on proportionality—itsself directed towards calculating and acting in accord with ratios or rates (Fiske, 2004; Rai & Fiske, 2011).

Moral judgment and choice: Utilitarianism vs. deontology

When investigating moral judgment and decision-making, both philosophy and psychology often refer to the dual-process approach (Greene, 2007, 2014). This framework differentiates between *deontology*, which states that morality of an action depends on the intrinsic nature of human actions regardless of their consequences (Kant, 1785/1959) and *utilitarianism* or *consequentialism*, which implies that morality of different actions is determined by their outcomes (Mill, 1861/1998). Proponents of the utilitarian position argue that moral decision-making should always lead to the best overall consequences for all concerned (Conway, Goldstein-Greenwood, Polacek, & Greene, 2018). Even though the tension between these two approaches has, for many years, been at the heart of the philosophical debate, it is also of great importance from the

standpoint of social psychology (Bartels, 2008; Greene, 2007). It concerns not only rather abstract and rare dilemmas such as whether to kill one person in order to save several others (Thomson, 1976), but also more practical, daily-life problems such as whether to fire a small group of workers during a recession to lower costs and save jobs for a larger group of employees.

Several years ago, Greene, Sommerville, Nystrom, Darley, and Cohen (2001) proposed a theoretical model that aimed to explain why, in some situations, people employ deontological reasoning, while in others they turn towards the utilitarian orientation (see also Greene, Cushman, Stewart, Lowenberg, Nystrom, & Cohen, 2009; Greene, Nystrom, Engell, Darley, & Cohen, 2004; Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008). According to this model (Paxton & Greene, 2010), moral decision-making is inherently associated with emotions. When emotional experience is sufficiently strong, people's judgments and choices are congruent with deontology. For example, deontological decision makers who act with intense negative feelings see killing one individual to save the lives of five as unacceptable. In contrast, when emotions are less intense, cognitive considerations prevail and decision-making becomes consistent with the utilitarian philosophy (e.g., it is acceptable to kill one individual to save the lives of five, because such a choice produces better consequences).

While alternative models that question the contrasting of emotional vs. cognitive processing in moral reasoning are currently being developed (Cushman & Fiery, 2013), the dual-process theory introduced by Greene and coauthors has, to date, gained considerable empirical support (e.g., Bartels, 2008; Cushman, Young, & Hauser, 2006; Greene et al., 2008; Greene et al., 2004; Koenigs et al., 2007; Moore, Clark, & Kane, 2008). In the theoretical model that is introduced and empirically verified in this paper, we propose one specific source of utilitarian moral decisions. We predict that thinking consistent with the market mindset and in congruence with market relationships leads to more utilitarian choices because it is associated with greater susceptibility to proportional reasoning. In the next section, we elaborate on the psychological characteristics of the market mindset that, as we argue, is important in the context of moral choice and then introduce our research hypotheses.

The psychology of the market mindset

People engage in various kinds of social interactions which they cognize, interpret, and regulate differently. Researchers in social sciences (e.g., Clark & Mills, 1993, 2012; Fiske, 1991, 2004) have developed theories to systemize knowledge about social relations. These theories differ in how many relational categories they specify, but all distinguish one specific type of

relationship: market relationships (also termed exchange relationships). When people engage in market relationships, they care about how much they get out of their investment and whether the repayment is of comparable value (Clark & Mills, 2012). Market relationships are often interpreted as in opposition to communal relationships, in which “benefits are given without the donor or the recipient feeling the recipient has an obligation to repay” (Clark & Mills, 2012, p. 234). Communal, but not market, relations are typically characterized by such values as helpfulness, friendship, generosity, and even altruism (Clark & Mills, 1993).

Market relationships emphasize rationality, logical thinking, efficiency, self-control, and equal exchange. As such, they do not allow for intimacy and emotional connectedness (Jiang, Chen, & Wyer Jr., 2014; Mead & Stuppy, 2014; Vohs, 2015). They are commonly those between sellers and buyers or employers and employees (Clark & Mills, 2012; Fiske, 2004). Such relationships, in most cases, are based on clear, comprehensible, and easy-to-recognize rules giving people insight into the situation and, as a consequence, the feeling of personal control over the course of events. They explicitly provide rules about: (a) who should be doing what, (b) the amount of outputs and inputs, and (c) the timing of the interaction. They also describe a predictable pattern of interplays among group members.

Importantly to our theoretical construct, Fiske (1991, 1992, 2004) proposed in his relational models theory that the core element and, at the same time, the main moral motive within market relationships (named market pricing in his model) is proportionality “directed toward calculating and acting in accord with ratios or rates for otherwise distinct goods to ensure that rewards or punishments for each party are proportional to their costs, contributions, effort, merit, or guilt” (Rai & Fiske, 2011, p. 64). Assuming that the tension between utilitarian and deontological moral decision-making reflects the distinction between calculating which choice maximizes the overall good on the one hand, and behaving with regard to a general rule irrespective of consequences on the other, we might predict that activating the market mindset that promotes proportional thinking will be supportive for the utilitarian philosophy.

Theoretical contribution and review of the studies

Rai and Fiske (2011), who proposed on the theoretical level that different types of social relations might be linked to distinct moral motives, gave several examples of moral reasoning offered by politicians. These generally involve thinking through the market-related rules and, as a consequence, selecting proportional argumentation. For example, these authors cite Secretary of State Madeleine Albright, who defended American sanctions against Iraq claiming (p. 64): “I

think this is a very hard choice, but the price—we think the price is worth it.” In another passage, Rai and Fiske (2011, p. 64) recall U.S. President Harry Truman, who stated that “a quarter of a million of the flower of our young manhood was worth a couple of Japanese cities,” while trying to explain reasons behind using atomic bombs against Hiroshima and Nagasaki. These two historic examples indicate that market-like proportional reasoning might easily be used to justify utilitarian moral choices.

We argue that proportional motives may not only excuse utilitarian decision-making but also facilitate it. Such a connection between interpreting the reality through the lens of market relationships and moral behavior was also suggested by Rai and Fiske (2011) in their relational model. These authors proposed that “people are motivated by Proportionality when making moral trade-offs that require doing harm or giving up some good in order to bring about a greater moral good” (p. 64). They also suggested that “Proportionality motives are used to frame judgments regarding acceptable losses for bringing about greater goods, such as in moral assessments of the acceptability of collateral damage, or in the use of kill ratios to justify sacrificing military personnel” (p. 64). We contribute to such theorizing by proposing that, when the market mindset is activated, people adjust their reasoning to the rule of proportionality—and, in consequence, employ a utilitarian approach to dealing with moral choices. We also hypothesize that the abovementioned effect might appear when people are merely primed with the idea of market relationships, even if they are not actually involved in them. Our general hypothesis is tested in a series of five experimental studies.

In Experiment 1, we use two classical moral dilemmas, the trolley dilemma and the bridge dilemma (Foot, 1967). These scenarios have been employed extensively to investigate people’s moral judgment and decision-making (Greene, 2014). In both dilemmas, people may decide whether to kill one individual in order to save lives of five others. Choices to kill one individual are coded as utilitarian, and choices to refrain from acting and letting five individuals die are coded as deontological. We show that those participants who were earlier primed with the market mindset (compared to those primed with the communal mindset and controls) are more prone to making utilitarian moral choices irrespective of the dilemma. In Experiment 2, we further demonstrate that thinking in terms of the market mindset leads to utilitarian decisions when using a scenario that is formally based on the trolley dilemma, but refers to a different domain. We also primed some participants with the market mindset and experimentally manipulated the ratio between numbers representing how many people will survive and how many people will die. This

serves to provide further support for the thesis that people exposed to market relations (but not those in the non-market mindset) are more susceptible to the proportions present in moral dilemmas. The results of this experiment show that people primed with the market mindset not only make utilitarian moral choices more often (compared to those primed with the communal mindset), but that their willingness to make such choices increases with the ratio between numbers (representing how many will survive and how many will be killed). In Experiment 3, we find that priming people with the market mindset leads to more utilitarian choices than in the control condition, but only when the number of potential deaths and saved lives is clearly specified (compared to when numbers of victims are unspecified). This is because the market mindset is closely associated with proportional thinking, which relies on comparing numbers. Its effect on moral choices disappears when information about the number of potential victims is only vaguely provided. In the preregistered Experiment 4, we show direct evidence of the role of the motivation to use proportional thinking (evoked by being exposed to market relationships) in moral decision-making. In particular, we demonstrate that the state motivation to use proportional thinking mediates the relationship between the market mindset (but not communal mindset) and utilitarian moral choices. Lastly, in the preregistered Experiment 5, we find that the link between the market mindset and utilitarian moral choices is sequentially mediated by the perception of orienting on rational, analytical processing and using proportions as right ways to solve moral dilemmas, but is not mediated by evaluating emotions as a proper basis for coping with moral considerations.

In all five experiments we use a novel method to activate the market mindset that has not been previously employed in experimental research. In this method, participants are presented with pictures exhibiting different types of social relations and are asked to answer several related questions. Our aim was to create a manipulation method that would be: (a) as abstract as possible (this is why we decided to use priming based on pictures, and not on language as in Zhang & Xin, 2019); (b) free of any cultural or demographical associations (silhouettes presented in the pictures do not represent specific gender, age, culture or other features); and (c) different from money priming methods used previously by other authors (for reviews see Vohs, 2015; Zaleskiewicz, Gasiorowska, & Vohs, 2017), because the market mindset, even if closely related to money, is a concept that goes beyond it and covers various aspects of exchange-type relationships (Clark & Mills, 1993, 2012). As we will show later in this paper in a more detailed way, manipulation checks suggest that this method of activating the market mindset is highly effective.

Experiment 1

The aim of this experiment was to test the hypothesis that the proportion of the utilitarian choices made in moral dilemmas will be higher among participants in the market mindset than among participants in either the communal or neutral mindset. To test this prediction, we used two moral dilemmas that have been extensively used in prior research on moral judgment and decision-making: the trolley dilemma and the footbridge dilemma (Greene, 2014; Greene et al., 2001). In both dilemmas, participants choose one of two options: (1) letting five persons die (default option) and (2) sacrificing one person to save the other five. We hypothesized that people primed with the market mindset will be more prone to choosing the latter option (sacrificing one person) in comparison to other conditions, because being in the market mindset is associated with greater susceptibility to proportions.

Two scenarios used in Experiment 1 represent two different classes of moral dilemmas: personal and impersonal (Greene, 2014; Greene et al., 2001; Greene & Haidt, 2002). As these authors propose, personal dilemmas differ from impersonal dilemmas in that they cause serious bodily harm to a particular person in such a way that the harm does not result from the deflection of an existing threat onto a different party. In other words, personal dilemmas (but not impersonal dilemmas) “require the harming (or killing) of another person or persons by an agent to achieve some goal, specifically when that harm is not simply redirected from one person or group onto another (that is, the agent must generate the harm themselves)” (Moore, Lee, Clark, & Conway, 2011, p. 186). We expected that this distinction would not interact with our main manipulation (i.e., the mindset manipulation) because greater susceptibility to proportionality should hold for both personal and impersonal dilemmas.

Method

Participants and design

We conducted a small meta-analysis of the studies on the psychological consequences of the relationships mode conducted by Saccardo, Li, Samek, and Gneezy (2015), Johnson and Grimm (2010) and Aggarwal (2004), and found a medium effect of such a manipulation (Hedge's $g = 0.804$). A priori power analyses using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) revealed that, given an alpha of .05 and a conventionally assumed power of .80, a sample of 20 participants per condition would be required to detect the effect of a similar size. As we used a novel manipulation to prime mindsets, we aimed to triple this number and recruit at least 60 participants to each experimental condition. The same sample size calculations were further used for Experiments 2 and 3.

Three hundred and seventy-seven U.S. participants were recruited from Amazon's Mechanical Turk using the TurkPrime platform. Participants (171 women, 206 men; $M_{age} = 36.09$ years, $SD = 11.83$) completed the survey in exchange for \$0.30. Participants were randomly assigned to one of the six experimental conditions in a 3 (market mindset vs. communal mindset vs. neutral condition) x 2 (impersonal dilemma vs. personal dilemma) between-subject design. Collection of the data was not continued after data analysis. No data were discarded¹.

Procedure

After giving informed consent and providing demographic information, participants were presented with a picture showing two people facing each other (Figure 1). The aim of presenting the picture was to prime the specific mindset: the market relationships mindset, the communal relationships mindset, or the neutral mindset. Depending on the experimental condition, participants saw one of the three versions of the picture (labeled A, B, or C in Figure 1). Picture A was presented to participants in the market mindset condition, picture B to participants in the communal mindset condition, and picture C to participants in the neutral condition. As displayed in Figure 1, each version of the picture contains two black cartoon silhouettes on a white background facing each other. In version A (the market mindset, $n = 137$), the character on the left holds a flat cardboard box with the sign “pizza” on it, while the character on the right hands money to the other character. This picture primes an exchange-type situation in which one person uses money to pay for a certain product. In version B (the communal mindset, $n = 129$), the character on the left holds a box wrapped like a gift, while the hands of the character on the right are empty. This picture is supposed to prime a situation of a close relationship in which one person selflessly hands over goods to another person. Finally, in version C, the two characters face each other with no indication of any specific type of interaction (neutral condition, $n = 111$).

Participants in all three conditions were asked to imagine a real-life situation similar to the one presented in the picture. Subsequently, their task was to describe the presented picture in as much detail as possible.

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Figure 1 about here

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¹ Our data and materials are publicly available at <https://osf.io/yqnda>

On the next screen, participants were asked to think about the interpretation of the picture they viewed on the previous page and to answer three questions presented in a random order. A 7-point scale (from 1 = “definitely not” to 7 = “definitely yes”) was used. The questions were related to the degree the participants’ interpretation of the picture: (1) was related to close relations between two people (e.g., as between friends or family members): “Does your interpretation of the picture reflect close relations between two people (e.g. between friends, family members, or colleagues)?”, and (2) reflected commercial relations between two people: “Does your interpretation of the picture reflect commercial relations between two people (e.g. in business or trade)?” These two questions served as a manipulation check. Participants also judged on a 7-point scale whether, in their opinion, the two people involved in a situation were close to each other: “How close are the two people in your interpretation?” (from 1 = “not close at all” to 7 = “very close”). The reason behind asking this question was that silhouettes presented on the two pictures priming either communal or market relationships may have been perceived as standing closer to each other (in the sense of the physical distance) than two silhouettes presented in the neutral picture. This in turn might have affected participants’ perceptions of their inter-personal closeness, and we wanted to control for such a potential confound.

On the following screen, participants were asked to read a scenario presenting a moral dilemma and to imagine themselves involved in such a quandry. Depending on the experimental condition, it was either the trolley dilemma (the impersonal dilemma condition, $n = 201$) or the footbridge dilemma (in the personal dilemma condition, $n = 176$). The exact wording of the two dilemmas is presented below.

The trolley dilemma:

Imagine you are standing beside some tram tracks. In the distance, you spot a runaway trolley hurtling down the tracks towards five workers who cannot hear it coming. Even if they do spot it, they won't be able to move out of the way in time. As this disaster looms, you glance down and see a lever connected to the tracks. If you pull the lever, the tram will be diverted down a second set of tracks away from the five unsuspecting workers. However, down this side track is one lone worker, just as oblivious as his colleagues.

The footbridge dilemma:

Imagine you are standing on a footbridge above the tram tracks. In the distance, you spot a runaway trolley hurtling down the tracks towards five workers who cannot hear it coming. Even if they do spot it, they won't be able to move out of the way in time. However,

there is large man standing next to you on the footbridge. You're confident that his bulk would stop the tram in its tracks. If you push the man on to the tracks, the tram will be stopped and won't hit five unsuspecting workers.

The scenario was presented together with a picture presenting the dilemma at hand (Figure 2A or 2B depending on the experimental condition) to help the participants visualize it better. After reading the scenario, participants were asked to indicate their decisions. In the case of the trolley dilemma, the scenario ended with a question of whether the participant would pull the lever, leading to one death but saving five, with two possible answers: "Yes, I would pull the lever" and "No, I would not pull the lever." In the case of the footbridge dilemma, the participants answered a question of whether they would push the man onto the tracks, leading to one death but saving five, choosing between two answers: "Yes, I would push the man on to the tracks" and "No, I would not push the man on to the tracks." In the case of both scenarios, we interpreted "Yes" answers as suggesting choices congruent with the utilitarian perspective and "No" answers as suggesting choices congruent with the deontological perspective. Such an interpretation of participants' choices was consistent with how prior research on moral decision-making analyzed people's responses in both the trolley dilemma and the bridge dilemma (Greene, 2014). The proportion of "yes" answers indicating the relative preference for the utilitarian solution served as the dependent variable.

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Figure 2 about here

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Results and discussion

Manipulation check

We conducted mixed ANOVA in order to examine the effect of mindset (market vs. communal vs. neutral) on participants' answers to two questions used as a manipulation check. The type of question (concerning close vs. commercial relations) served as a within-subject factor, while the mindset manipulation was a between-subject factor. The analysis did not reveal a significant effect of the type of question, $F(1, 374) < 0.01, p = .969$, partial $\eta^2 < .001$. The main effect of the mindset manipulation was significant, $F(2, 374) = 4.41, p = .013$, partial $\eta^2 = .023$, and so was the interaction between the two factors, $F(2, 374) = 159.29, p < .001$, partial $\eta^2 = .460$. Further analyses revealed that the description of the neutral picture was perceived as related to close relations ($M = 4.65, SD = 2.04$) to a higher extent than it was perceived as related to

commercial relations ($M = 3.84$, $SD = 2.13$), $F(1, 110) = 7.25$, $p = .008$, partial $\eta^2 = .062$. At the same time, the description of the “pizza-for-money” picture was perceived as related to commercial relations ($M = 6.37$, $SD = 1.01$) to a greater extent than it was perceived as related to close relations ($M = 2.97$, $SD = 2.08$), $F(1, 128) = 232.57$, $p < .001$, partial $\eta^2 = .631$, while the description of the “gift” picture was perceived as related to commercial relations to a lesser extent ($M = 5.17$, $SD = 1.50$) than when it was perceived as related to close relations ($M = 3.14$, $SD = 1.92$), $F(1, 128) = 120.25$, $p < .001$, partial $\eta^2 = .484$. These analyses confirmed that the manipulation of the mindset was successful. Moreover, we tested whether two characters presented in pictures were perceived as being close to each other. Analysis of variance revealed significant main effect of mindset manipulation, $F(2, 374) = 174.64$, $p < .001$, partial $\eta^2 = .236$. Further planned contrasts revealed that the silhouettes shown on the “gift” picture ($M = 5.36$, $SD = 1.23$) were perceived as being closer to each other than the silhouettes on the neutral picture ($M = 4.11$, $SD = 1.86$), $F(1, 374) = 31.22$, $p < .001$, partial $\eta^2 = .077$, while the silhouettes on the neutral picture were perceived as being closer to each other than those on the “pizza-for-money” picture ($M = 3.07$, $SD = 2.02$), $F(1, 374) = 21.79$, $p < .001$, partial $\eta^2 = .055$. These results suggest that the physical distance between the silhouettes did not impact their perception as being close to each other.

Hypothesis testing

To test our research hypothesis that people primed with the market mindset will be more prone to choosing the utilitarian option (sacrificing one person) than people primed with two other mindsets (communal or neutral), we performed a logistic regression with mindset manipulation, dilemma type, and their interaction as predictors, and participants’ choices as the dependent variable. Since the mindset manipulation was a multi-categorical variable, we used indicator coding with the neutral condition as a reference category (see Hayes & Preacher, 2014), with one dummy variable representing the market-mindset manipulation and a second dummy variable representing the communal mindset manipulation. The logistic regression model was significant, $\chi^2(5) = 74.28$, $p < .001$, Nagelkerke $R^2 = .23$. The main effect of the dilemma (impersonal vs. personal) was significant, $b = 1.73$, $se = 0.42$, $Z = 4.15$, $p < .001$, in that participants were more prone to making utilitarian choices in the impersonal (74.12%, $n = 149$ out of 201 participants in this condition), as opposed to the personal, dilemma (32.95%, $n = 58$ out of 176 participants in this condition). This result is consistent with prior research on making moral decisions (Greene, 2014; Greene et al., 2001) that indicated people’s motivation to make utilitarian choices to be

greater in impersonal situations. As we expected, the effect of the market mindset manipulation was significant, $b = 0.67$, $se = 0.29$, $Z = 2.34$, $p = .019$ (see Figure 3), such that people primed with the market mindset were more prone to making utilitarian choices (64.23%, $n = 88$ out of 137 participants in this condition) than those in the neutral condition (49.54%, $n = 55$ out of 111 participants in this condition). The effect of the communal mindset manipulation (vs. neutral condition) was not significant, $b = -0.008$, $se = 0.286$, $Z = -0.027$, $p = .978$, with 49.61% of participants in the communal condition who chose utilitarian option ($n = 64$ out of 129 participants in this condition). The mindset by dilemma type interactions were not significant, $\chi^2(2) = 0.14$, $p = .93$ for the highest order unconditional interaction, $b = 0.12$, $se = 0.57$, $Z = 0.32$, $p = .75$ for communal mindset by dilemma type interaction, and $b = 0.003$, $se = 0.57$, $Z = 0.01$, $p = .995$ for the market mindset by dilemma type interaction.

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Figure 3 about here

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The results of Experiment 1 supported our hypothesis that making moral choices may be driven by the specific mindset and showed that people primed with the market mindset were more willing to make choices congruent with the utilitarian perspective than those in the neutral condition. This effect did not appear to hold for the communal condition. This tendency was also found to be independent of whether people solved either personal or impersonal moral dilemmas. The results presented above allow us to conclude that priming people with the market mindset brings them closer to the utilitarian attitude and makes them more prone to sacrificing one life in order to save more lives.

Experiment 2

The main aim of this experiment was to further support the prediction that being primed with the market mindset makes the decision maker more prone to choices in line with the utilitarian perspective because such a mindset stimulates and facilitates proportional thinking (Fiske, 2004). If this expectation is correct, people with the market mindset (but not the communal mindset) should be more susceptible to the proportions present in moral dilemmas. In other words, they should make even more utilitarian choices when the ratio between numbers representing how many people will survive and how many people will die is higher than when it is lower. However, people primed with the communal mindset should not be sensitive to such information, or at least they should be less prone to being affected by the proportion involved in the scenario description.

To test that hypothesis, in Experiment 2 we manipulated the proportion of the number of potential lives to be saved in a moral dilemma that was presented to participants. We expected that participants primed with the market mindset would not only be more willing to make utilitarian choices than those primed with the communal mindset, but that their readiness to make decisions in line with the utilitarian philosophy would be more pronounced in the six victims condition (compared to the three victims condition).

The two dilemmas we used in Experiment 1 (the trolley dilemma and the footbridge dilemma) are considered to be a very popular tool in investigating people's moral preferences. However, research on moral judgment and decision-making (Horne & Powell, 2016; Moore et al., 2008) typically uses a broader set of scenarios representing a range of moral actions. Therefore, in this study we aimed at replicating the effects found in Experiment 1 by employing a scenario that is formally based on the classical trolley/footbridge dilemmas, but refers to a different domain.

Another goal of Experiment 2 was to rule out potential alternative explanations of the results of Experiment 1. In our theoretical model, we propose that exposure to market relationships positively influences the level of utilitarian choices because one of the psychological features of these relationships is proportional thinking. One conceivable—but in our view unlikely—alternative explanation of the relation between the market mindset and utilitarian choices is based on the fact that market relationships are in most cases associated with money, and that the link between market relationships and utilitarian choices is only another expression of the widely known money priming effect (Vohs, Mead, Goode, 2006; Zaleskiewicz et al., 2017). Indeed, prior research demonstrated that participants primed with money were more focused on numbers or calculative thinking than those not primed with money (Kouchaki, Smith-Crowe, Brief, & Sousa, 2013; Su & Gao, 2014). In order to reject this explanation, in Experiment 2 we manipulated not only the proportion of the number of potential lives to be saved in a moral dilemma (three victims vs. six victims) and the type of relationships (market vs. communal) but also the visual salience of money (money present vs. money absent). If it were the money priming that caused the effects we found in earlier studies, then pictures including money would trigger utilitarian choices similarly to pictures not including money, regardless if they were described in communal or market terms. However, this is not what we hypothesized. Our prediction was that exposure to market relationships would cause an increase in participants' willingness to make utilitarian choices when compared to exposure to communal relationships, irrespective of money being present or absent.

Method

Participants and design

We recruited 808 U.S. participants from Amazon's Mechanical Turk using the TurkPrime platform in exchange for \$0.30 (347 women, 461 men; $M_{age} = 35.20$ years, $SD = 10.40$).

Participants were randomly assigned to one of the eight conditions in a 2 (market relationships vs. communal relationships) x 2 (money present vs. money absent) x 2 (three victims vs. six victims) between-subject experimental design. Collection of the data was not continued after data analysis. No data were discarded.

Procedure

After providing an informed consent and answering demographical questions on gender and age, participants were informed that they would be presented with a picture accompanied by the description of the situation depicted on this picture provided earlier by other participants in a different study. Then, some of the participants were shown a picture presenting two black cartoon silhouettes on a white background facing each other, with a character on the left handing a paper bag with groceries and a character on the right handing money (money present condition, $n = 387$). The rest of the participants were presented with the same picture, except that the character on the right handed over nothing (money absent condition, $n = 421$). Half the participants ($n = 426$) viewed the following text (describing the communal relationship): “The person on the left has gone to the store for an elderly neighbor and they brought them groceries. The elderly neighbor on the right is collecting groceries and thanking for help,” while the rest of participants ($n = 382$) viewed text describing the market relationship: “The person on the left is delivering groceries to the person on the right who ordered in online. The person on the right is buying the groceries online because their car broke down.”

On the next screens, participants were asked to think about interpretation of the picture they saw on the previous page and to answer two questions on whether it was related to close relationships or business relationships (the same as those used in Experiment 1). A 7-point scale (1 = “definitely not” to 7 = “definitely yes”) was used. These questions served as a manipulation check. Finally, participants were asked to read a scenario presenting an impersonal moral dilemma and imagine themselves involved in such a scenario. We choose a Standard Fumes dilemma—an impersonal dilemma from the standard battery created by Moore et al. (2008) and revised by Horne and Powell (2016). This stimulus involves direct information about the proportion of victims. Half the participants read the dilemma in its standard version, where sacrificing one

patient would lead to saving three of them ($n = 388$), while the rest read the modified version, with six potential patients to be saved ($n = 420$). The exact wording of the dilemma is as follows:

You are the late-night watchman in a hospital. Due to an accident in the building next door, there are deadly fumes rising up through the hospital's ventilation system. In a certain room of the hospital are three (six) patients. In another room there is a single patient. If you do nothing the fumes will rise up into the room containing the three (six) patients and cause their deaths. The only way to avoid the deaths of these patients is to hit a certain switch, which will cause the fumes to bypass the room containing the three patients. As a result of doing this the fumes will enter the room containing the single patient, causing his death.

The Standard Fumes dilemma ends with the question of whether the participant would hit the switch leading to one death but saving three or six lives, depending on the experimental condition. After reading the scenario, participants were asked to indicate their choice. There were two possible answers: "Yes, I would hit the switch" and "No, I would not hit the switch." As in Experiment 1, the proportion of answers "yes" indicated the relative preference for the utilitarian solution and served as the dependent variable.

Results and discussion

Manipulation check

We conducted mixed ANOVA in order to examine the impact of the type of the relationship manipulation (market relationships vs. communal relationships) and money cues manipulation (money absent vs. money present) on participants' answers to two questions used as a manipulation check. The type of question (on close relations vs. on commercial relations) served as a within-subject factor, while the experimental manipulations were between-subject factors. We observed a main effect of the type of question, $F(1, 804) = 67.05, p < .001$, partial $\eta^2 = .077$. The effects of the money presence manipulation, $F(1, 804) = 1.65, p = .200$, partial $\eta^2 = .002$, and of the mindset manipulation $F(1, 804) = 0.57, p = .451$, partial $\eta^2 = .001$, were not significant. All the two-way interactions were significant, respectively, $F(1, 804) = 424.98, p < .001$, partial $\eta^2 = .346$ for the mindset by question type interaction, $F(1, 804) = 23.92, p < .001$, partial $\eta^2 = .029$ for the money presence by question type interaction, and $F(1, 804) = 4.31, p = .038$, partial $\eta^2 = .005$ for the money presence by mindset interaction. The three-way interaction was also significant, $F(1, 804) = 13.88, p < .001$, partial $\eta^2 = .017$. These results suggest that not only the description of the situation, but also the presence of money cues might have had an impact on whether it was

perceived as market-related or communal. For that reason, we conducted two further ANOVAs, with the two questions as dependent variables and both manipulations as independent variables. The first analysis examining how much the interpretation of the situation was related to close relationships revealed a significant and strong effect of the relationships manipulation such that the “help-for-neighbor” situation was perceived as much more communal ($M = 5.28$, $SD = 1.60$) than the “delivery” situation ($M = 3.18$, $SD = 1.99$), $F(1, 804) = 280.185$, $p < .001$, partial $\eta^2 = .258$. Moreover, the situation was perceived as less communal when the picture involved money ($M = 4.09$, $SD = 2.05$) than when it did not ($M = 4.48$, $SD = 2.09$), but the effect, although significant, was much weaker, $F(1, 804) = 10.050$, $p = .002$, partial $\eta^2 = .012$. The two manipulations marginally interacted with each other, $F(1, 804) = 3.27$, $p = .070$, partial $\eta^2 = .004$. Further decomposition of this interaction indicated that participants who have read the description of the “delivery” situation evaluated it as equally related to close relations, independent of whether the money cue was present ($M = 3.09$, $SD = 1.97$) or not ($M = 3.26$, $SD = 2.01$), $F(1, 804) = 0.87$, $p = .350$, partial $\eta^2 = .001$. However, participants who read the description of the “help-for neighbor” situation evaluated it as less related to close relationships when money was present ($M = 4.96$, $SD = 1.69$) than when it was absent ($M = 5.59$, $SD = 1.45$), $F(1, 804) = 13.14$, $p < .001$, partial $\eta^2 = .016$.

The analysis for the question on how much the interpretation of the situation was related to commercial relationships also revealed a strong main effect of the type of the relationships manipulation, such that the “help-for-neighbor” situation was perceived as less market-related ($M = 4.02$, $SD = 1.99$) than the “delivery” situation ($M = 6.03$, $SD = 1.27$), $F(1, 804) = 296.45$, $p < .001$, partial $\eta^2 = .269$. Also, the situation was perceived as more market-related when the picture involved money ($M = 5.28$, $SD = 1.79$) than when it did not ($M = 4.69$, $SD = 2.08$). However, here also, the effect—although significant—was much weaker, $F(1, 804) = 24.52$, $p < .001$, partial $\eta^2 = .030$. We also observed a significant two-way interaction between the two manipulations, $F(1, 804) = 19.56$, $p < .001$, partial $\eta^2 = .024$. Further decomposition of this interaction indicated that participants who read the description of the “delivery” situation evaluated it as equally related to market—independent of whether the money cue was present ($M = 6.07$, $SD = 1.25$) or not ($M = 6.00$, $SD = 1.29$), $F(1, 804) = 0.13$, $p = .716$, partial $\eta^2 < .001$. However, participants who read the description of the “help-for neighbor” situation evaluated it as more market-related when money was present ($M = 4.58$, $SD = 1.90$) than when it was absent ($M = 3.50$, $SD = 1.94$), $F(1, 804) = 46.51$, $p < .001$, partial $\eta^2 = .055$.

Hypothesis testing

Thus far, we demonstrated that presenting money cues together with the description of social situation might indeed lead to perceiving such a situation as less communal and more market-related than when the market cues are absent. This effect was especially prevalent when the situation involved originally communal (as opposed to market) features. In other words, money seemed to be such a strong symbol of the market that even subtle cues related to it might elicit perceptions of the social world consistent with the market mode. However, in this study we aimed at demonstrating that it is the relational mindset and not money itself that triggers utilitarian choices. To test this hypothesis, we conducted a logistic regression with market-mindset manipulation, money-presence manipulation, number-of-victims manipulation, and all interactions between them as predictors. The logistic regression model was significant, $\chi^2(7) = 67.80, p < .001$, Nagelkerke $R^2 = .11$. The main effect of the mindset manipulation was significant, $b = 1.23, se = 0.19, Z = 6.405, p < .001$, such that people primed with the market mindset were more apt to make utilitarian choices (82.98%, $n = 317$ out of 382 participants in this condition) than people primed with the communal mindset (63.61%, $n = 271$ out of 426 participants in this condition). The effect of the number of victims was also significant, $b = 0.84, se = 0.19, Z = 4.50, p < .001$, such that people were more apt to make utilitarian choices when they had a chance to save six patients sacrificing one (78.33%, $n = 329$ out of 420 participants in this condition) than when they could save three patients sacrificing one (66.75%, $n = 259$ out of 388 participants in this condition). The main effect of money priming was not significant, $b = -0.10, se = 0.19, Z = -0.53, p = .598$. The interaction between mindset and number of victims, which is crucial for our theoretical model, was significant, $b = 1.26, se = 0.38, Z = 3.32, p < .001$. None of the other interactions was significant, respectively: $b = -0.18, se = 0.38, Z = -0.47, p = .636$ for the mindset by the money cues interaction², $b = -0.32, se = 0.37, Z = -0.88, p = .381$ for the number of victims by money cues interaction, and $b = -0.92, se = 0.76, Z = -1.22, p = .224$ for the three-way interaction.

² As suggested by one of the Reviewers, it might be incredulous that, although we found significant interactions between presence of money cues and description of situation as communal or market related on items used as a manipulation check, we did not observe respective interaction for our dependent variable. However, the effect of money priming on manipulation checks was either absent or very weak, depending on the condition, when compared to the strength of mindset manipulation. Hence, we were not surprised that we did not find an effect of money priming (nor a significant interaction of other manipulations with money priming) on our DV. We do not think that the absence of significant three-way-interaction stems from a power limitation in our study. We conducted sensitivity analysis and found that with a sample of 808 participants we would be able to detect an effect size as small as $\eta^2 = .0129$ with power equal to .9, and an effect size as small as $\eta^2 = .0096$ with power equal to .8 at significance level $\alpha = .05$. Since money priming by mindset interaction is not significant, its size is probably much smaller than that, and thus, increasing sample size even more would not allow finding a meaningful (not only statistically significant) effect.

Further decomposition of the interaction between mindset priming and the number of victims revealed that participants who have read the description of the “help-for neighbor” situation made similar choices independently of the number of potential victims to be saved, $b = 0.24$, $se = 0.20$, $Z = 1.18$, $p = .237$. A comparable proportion of participants chose the utilitarian option when six patients could be saved (66.22%, $n = 149$ out of 225 participants in this condition) and when three patients could be saved (60.70%, $n = 122$ out of 201 participants in this condition). However, in line with our prediction, participants who had read the description of the “delivery” situation were more apt to make utilitarian choices when six patients could be saved (92.31%, $n = 180$ out of 195 participants in this condition) than when three patients could be saved (73.26%, $n = 137$ out of 187 participants in this condition), $b = 1.48$, $se = 0.31$, $Z = 4.68$, $p < .001$ (see Figure 4).

Alternative decomposition of the interaction demonstrated that the market mindset manipulation had an impact on participants’ choices both when they could save three patients, $b = 0.57$, $se = 0.22$, $Z = 2.61$, $p = .009$, and when they could save six patients, $b = 1.81$, $se = 0.30$, $Z = 5.97$, $p < .001$, but the effect in the latter condition was stronger than it was in the former condition.

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Figure 4 about here

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The present study not only replicated our prior results showing the association between the exposure to market relationships and the willingness to make utilitarian choices in moral dilemmas, but also demonstrated that people in the market mindset reacted to the proportion between patients to be sacrificed and patients to be saved, while people in the communal mindset did not. Moreover, this association was not due to money cues involved in the market-type manipulation. Although money might indeed trigger the perception of a certain situation as market-related, market relationships seem to be associated with proportionality, not just because they involve money as a unit of account, but rather because making calculations is easier when one uses money.

Experiment 3

The results of Experiment 2 showed that those decision makers who were primed with the market mindset were more sensitive to the number of potential lives to be saved in a moral

dilemma. However, dilemmas used in the moral psychology research, as well as dilemmas we face in real life, do not always provide information about consequences resulting from a given choice in the form of clear numerical proportions (Home & Powell, 2016; Moore et al., 2008). For example, some dilemmas offer a precise ratio of potential deaths and saved lives, depicting proportions with specified numbers (i.e., one victim vs. three victims) while others display the decision consequences in an unspecified way (i.e., a person vs. a group). Our main theoretical assumption is that the market mindset is closely associated with proportional thinking, which is based on comparing numbers. The main goal of Experiment 3 was to collect further empirical support for this assumption. As the market mindset is firmly connected to the proportional style of thinking, our prediction was that participants primed with the market mindset will make more utilitarian choices compared to participants in the neutral condition, but only when the number of potential deaths and saved lives is clearly specified (compared to when the number of victims is unspecified).

Method

Participants and design

We recruited 669 U.S. participants from Amazon's Mechanical Turk using the TurkPrime platform in exchange for \$0.30. Twenty-five of them were excluded as they did not provide a valid answer to the open question on the picture content. The final sample consisted of 645 participants (332 women, 313 men; $M_{age} = 35.10$ years, $SD = 10.74$). Participants were randomly assigned to one of the four conditions in a 2 (market mindset vs. neutral condition) x 2 (specified number of victims vs. unspecified number of victims) between-subject experimental design. Here, we decided to confront the neutral condition only with the market mindset condition, because in Experiment 1 no significant differences between the neutral condition and the communal mindset condition were found. Collection of the data was not continued after data analysis.

Procedure

After providing an informed consent and answering demographical questions on gender and age, participants were presented with a picture showing two people facing each other. The aim of presenting the picture was to prime the specific mindset: the market mindset or the neutral mindset. We used the same pictures as in Experiment 1 (labeled as A and C in Figure 1). Picture A was presented to participants in the market mindset condition and picture C to participants in the neutral condition. Participants in both conditions were asked to imagine a real-life situation similar to that presented in the picture. Subsequently, they were asked to describe the presented picture in

as much detail as possible. On the next screen, they were asked to think about the interpretation of the picture they saw on the previous screen and to answer three questions presented in a random order (the same as in Experiment 1).

Finally, participants were asked to read a scenario presenting a moral dilemma and to imagine themselves involved in solving it. In the present experiment, we again used a Standard Fumes dilemma (Home & Powell, 2016; Moore et al., 2008). Half the participants ($n = 316$) read the dilemma in its standard version, in which sacrificing one patient leads to saving three of them, while the rest ($n = 329$) read the modified version, with unspecified proportions of patients saved or lost. The exact wording of the dilemma is presented below.

You are the late-night watchman in a hospital. Due to an accident in the building next door, there are deadly fumes rising up through the hospital's ventilation system. In a certain room of the hospital are three [some] patients. In another room there is a single [one] patient. If you do nothing the fumes will rise up into the room containing the three [group of] patients and cause their deaths. The only way to avoid the deaths of these patients is to hit a certain switch, which will cause the fumes to bypass the room containing the three [the group of] patients. As a result of doing this the fumes will enter the room containing the single [one] patient, causing his death.

After reading the scenario, participants were asked to indicate if they would hit the switch leading to one death but saving *three lives* in the specified proportions condition or saving *other lives* in the unspecified proportions condition. There were two possible answers: "Yes, I would hit the switch" and "No, I would not hit the switch." As in previous experiments, the proportion of answers "yes" indicating the relative preference for the utilitarian solution served as the dependent variable.

Results and discussion

Manipulation check

We conducted mixed ANOVA in order to examine the effect of mindset (market vs. neutral condition) on participant's answers to two questions used as a manipulation check. The type of question (concerning close vs. commercial relations) served as a within-subject factor, while the mindset manipulation was a between-subject factor. The analysis revealed a significant effect of the type of question, $F(1, 643) = 382.02, p < .001$, partial $\eta^2 = .373$, significant main effect of the mindset manipulation, $F(1, 643) = 7.30, p = .007$, partial $\eta^2 = .011$, and a significant interaction between the two factors, $F(1, 643) = 617.50, p < .001$, partial $\eta^2 = .490$. Further

analyses revealed that the description of the neutral picture was perceived as related to close relations ($M = 4.34$, $SD = 1.92$) to a higher extent than it was perceived as related to commercial relations ($M = 3.83$, $SD = 1.85$), $F(1, 295) = 11.64$, $p = .001$, partial $\eta^2 = .038$. At the same time, the description of the “pizza-for-money” picture was perceived as related to commercial relations ($M = 6.47$, $SD = 1.02$) to a greater extent than it was perceived as related to close relations ($M = 2.17$, $SD = 1.74$), $F(1, 348) = 1191.47$, $p < .001$, partial $\eta^2 = .774$. These analyses confirmed that the manipulation of the mindset was successful. Moreover, we tested whether silhouettes presented in pictures were perceived as being close to each other. Analysis of variance revealed significant main effect of the mindset manipulation, $F(1, 643) = 104.79$, $p < .001$, partial $\eta^2 = .140$. The silhouettes on the neutral picture were perceived as being closer ($M = 4.04$, $SD = 1.51$) than silhouettes in the “pizza-for-money” picture ($M = 2.66$, $SD = 1.85$). These results suggest that physical distance between the silhouettes did not impact its perception of being close to each other.

Hypothesis testing

In the present experiment, we tested the hypothesis that participants in the market mindset would make more utilitarian choices compared to people in the neutral mindset only when the numbers of potential deaths and saved lives was clearly specified (compared to when these numbers were unspecified). To test the hypothesis, we conducted a logistic regression with the market mindset manipulation, specificity of the proportion manipulation, and interaction between them as predictors. The logistic regression model was significant, $\chi^2(3) = 8.91$, $p = .031$, Nagelkerke $R^2 = .020$. The main effect of the mindset (market vs. neutral) was not significant, $b = 0.27$, $se = 0.18$, $Z = 1.49$, $p = .136$, while the main effect of the dilemma was marginally significant (specified vs. unspecified proportions), $b = 0.31$, $se = 0.18$, $Z = 1.70$, $p = .088$. However, consistent with our expectations, the analysis revealed a significant interaction between those two manipulations, $b = 0.75$, $se = 0.36$, $Z = 2.08$, $p = .038$ (see Figure 5). Further decomposition of the interaction effect revealed that when the number of victims was explicitly specified, participants in the market mindset condition were more prone to make utilitarian choices (81.66%, $n = 147$ out of 180 participants in this condition) than controls (69.85%, $n = 95$ out of 136 participants in this condition), $b = 0.65$, $se = 0.25$, $Z = 2.57$, $p = .010$. However, when the number of victims was unspecified, the market mindset manipulation did not affect the level of utilitarian choices, $b = -0.10$, $se = 0.26$, $Z = -0.38$, $p = .702$. Respectively, 71.87% of participants ($n = 115$ out of 160) from the neutral condition and 69.82% of participants ($n = 118$ out of 169)

from the market condition chose the utilitarian option. Both results were consistent with our predictions.

A different investigation of the results we found in Experiment 3 suggests that participants in the neutral condition made similar choices, irrespectively of whether the number of potential victims was specified or unspecified, $b = -0.10$, $se = 0.24$, $Z = -0.41$, $p = .682$. However, participants who were primed with the market mindset made utilitarian choices significantly more often when the number of victims was specified than when it was unspecified, $b = 0.654$, $se = 0.268$, $Z = 2.436$, $p = .015$.

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Figure 5 about here

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In Experiment 3 we demonstrated that people primed with the market mindset were more prone to making decisions in accordance with the utilitarian perspective when the number of victims was clearly specified (i.e. when information about the consequences resulting from a given choice contained clear numerical proportions) and that this effect vanished when the numerical consequences of the decision were unspecified. We conclude that these results are due to the fact that the market mindset triggers proportional style of thinking and that it is the motivation to use and process numbers and proportions that facilitates utilitarian moral choices.

Experiment 4

In the present experiment, we predicted that participants primed with the market mindset would make more utilitarian choices compared to participants in the neutral condition, and that this effect would be mediated by the motivation to concentrate on proportions (proportional thinking). In this experiment, unlike in experiments from 1 to 3, we investigated the psychological mechanism of interest using mediation analysis. Therefore, we decided to again have the complete design with three conditions: market mindset condition, communal mindset condition, and neutral condition to demonstrate that proportional thinking is triggered by the market mindset exclusively. More precisely, we expected that the market mindset priming, but not communal mindset priming (vs. neutral condition) will trigger the general motivation to use proportional thinking, while higher level of proportional thinking will be associated with a greater tendency to choose utilitarian option in the moral dilemma.

For this study, we preregistered our hypotheses, experimental design, measures, analyses, sample size, and exclusions on <https://aspredicted.org/37ix8.pdf>

Method

Participants and design

First, we conducted a small meta-analysis of our previous experiments performed in this project, and found a weak effect of the mindset manipulation (Hedge's $g = 0.456$). A priori power analyses using G*Power (Faul et al., 2007) revealed that given an alpha of .05 and a conventionally assumed power of .80, a sample of 61 participants per condition would be required to detect the effect of a similar size. We aimed to double this number and recruit at least 122 participants to each experimental condition in this study (366 participants altogether).

We recruited 374 U.S. participants from Amazon's Mechanical Turk using the TurkPrime platform in exchange for \$0.50. Five of them were excluded as they did not provide a valid answer to the open question on the picture content. The final sample consisted of 369 participants (159 women, 210 men; $M_{age} = 36.18$ years, $SD = 10.88$). Participants were randomly assigned to one of the three conditions: the market mindset condition ($n = 133$) vs. communal mindset condition ($n = 126$) vs. neutral condition ($n = 110$). Collection of the data was not continued after data analysis.

Procedure

First, participants were asked to provide an informed consent, answer demographical questions on gender and age, and enter the current year (this item served as the attention check). Then they were presented with one of the three pictures showing two people facing each other, same as in Experiment 1 (Figure 1). Participants in all three conditions were asked to imagine a real-life situation similar to the one presented in the picture and to describe the presented picture in as much detail as possible. On the next screen, they were asked to think about the interpretation of the picture they saw on the previous screen and to answer three questions presented in a random order (the same as in Experiment 1).

Then, participants were asked to read seven items that we designed to measure the state motivation to use numbers and proportions. These items referred to several decision situations not related to any moral considerations, in which people may rely on different information from external sources. In each case, we asked participants to choose between option based on anecdotal arguments (for example, opinion of a friend) and option based on ratios, proportions or/and numbers (for example, the proportion of positive to negative opinions of former users). The exact wording of an example of such item is presented below:

Imagine, you are planning to spend the next evening in a cinema. You have to decide which of the two movies to watch. Both will be shown exactly at the same time. While making

your decision, which type of information would you probably use?

a) The proportion of positive and negative reviews in a popular movies website

b) The opinion of one of your colleagues who have recently watched both movies

We calculated the number of items in which participants chose the option based on ratios and numbers to form the variable serving as a mediator ($M = 2.99$, $SD = 1.61$, range from 0 to 7) with higher scores indicating stronger motivation to use proportional thinking.

Finally, participants were asked to read a scenario presenting a moral dilemma and to imagine themselves involved in solving it. In the present experiment, we used a dilemma chosen from the battery of classical dilemmas used by Patil et al. (2018). The exact wording of the dilemma is presented below.

You are leading a rescue team for seven miners that are stuck in an underground mine, which is flooding. Six miners are trapped at the bottom and will drown if not rescued soon. One miner is trapped higher in the elevator shaft and will not drown. The only way to rescue the six at the bottom is to quickly send down the mine elevator. If you do this, the one miner in the shaft will be crushed to death. If you do not send down the elevator, you will have enough time to rescue the one miner in the shaft.

After reading the scenario, participants were asked to indicate if they would send down the mine elevator to rescue the six miners at the bottom. The two possible answers were: "Yes, I would send down the elevator" and "No, I would not send down the elevator." As in previous experiments, the proportion of answers "yes" indicating the relative preference for the utilitarian solution served as the dependent variable.

Results and discussion

Manipulation check

We conducted mixed ANOVA in order to examine the effect of mindset (market vs. neutral condition) on participant's answers to two questions on whether the interpretation of the picture was related to close and commercial/business relations. The type of question (concerning close vs. commercial relations) served as a within-subject factor, while the mindset manipulation was a between-subject factor. The analysis revealed a significant effect of the type of question, $F(1, 368) = 12.58$, $p < .001$, partial $\eta^2 = .033$, significant main effect of the mindset manipulation, $F(1, 368) = 4.81$, $p = .009$, partial $\eta^2 = .026$, and a significant interaction between the two factors, $F(1, 368) = 197.52$, $p < .001$, partial $\eta^2 = .519$. Further analyses revealed that the description of the "gift" picture was perceived as related to close relations ($M = 5.80$, $SD = 1.25$) to a higher

extent than it was perceived as related to commercial relations ($M = 3.62$, $SD = 2.09$), $F(1, 125) = 96.83$, $p < .001$, partial $\eta^2 = .437$. At the same time, the description of the “pizza-for-money” picture was perceived as related to commercial relations ($M = 6.57$, $SD = 0.69$) to a greater extent than it was perceived as related to close relations ($M = 2.65$, $SD = 2.10$), $F(1, 132) = 347.12$, $p < .001$, partial $\eta^2 = .724$. Finally, the description of the neutral picture was perceived as related to close and commercial relations to the same extent, $F(1, 109) = 1.61$, $p = .207$, partial $\eta^2 = .015$. These analyses confirmed that also in this experiment, the manipulation of the mindset was successful. Additionally, we again tested whether silhouettes presented in pictures were perceived as being close to each other. Analysis of variance revealed significant main effect of the mindset manipulation, $F(1, 366) = 75.83$, $p < .001$, partial $\eta^2 = .293$. The silhouettes in the neutral picture were perceived as being less close to each other ($M = 4.08$, $SD = 1.63$) than silhouettes in the communal picture ($M = 5.60$, $SD = 1.19$), $F(1, 366) = 49.12$, $p < .001$, partial $\eta^2 = .118$, but more close to each other than silhouettes in the “pizza-for-money” picture ($M = 3.07$, $SD = 2.031$), $F(1, 366) = 49.12$, $p < .001$, partial $\eta^2 = .118$. These results again suggested that physical distance between the silhouettes did not impact its perception of being close to each other.

Hypotheses testing

To test our research hypotheses, we performed logistic regression with mindset manipulation as the predictor and participants’ choices as the dependent variable. Since the mindset manipulation is a multicategorical variable, we used indicator coding with the neutral condition as a reference category (Hayes & Preacher, 2014), with one dummy variable representing the market mindset manipulation, and second dummy variable representing the communal mindset manipulation. The logistic regression model was significant, $\chi^2(2) = 9.34$, $p = .009$, Nagelkerke $R^2 = .035$. As in Experiment 1, the effect of the communal mindset manipulation was not significant, $b = -0.10$, $se = 0.27$, $Z = -0.36$, $p = .719$. Additionally, as we predicted, the effect of the market mindset manipulation was significant, $b = 0.67$, $se = 0.28$, $Z = 2.36$, $p = .018$, such that people primed with the market mindset were more prone to making utilitarian choices than those in the neutral condition. Respectively, 59.52% of participants in the communal condition ($n = 75$ out of 126), 75.94% of participants in the market condition ($n = 101$ out of 133) and 61.82% of participants in the neutral condition chose the utilitarian option ($n = 68$ out of 110).

In the present experiment, we aimed at testing the hypothesis that participants in the market mindset (but not in the communal mindset) would make more utilitarian choices compared to people in the neutral mindset, because the market mindset triggers the motivation to use

proportional thinking. Regression analysis revealed a significant effect of mindset manipulation on the motivation to use proportional thinking, $F(2, 366) = 4.62, p = .010, R^2 = .021$. The effect of communal mindset manipulation (vs neutral manipulation) was not significant, $b = -0.06, se = 0.21, t = -0.29, p = .771$, while the effect of the market mindset manipulation was significant and positive, $b = 0.45, se = 0.21, t = 2.16, p = .031$. Participants in the market condition declared the highest level of motivation to use proportional thinking ($M = 3.30, SD = 1.67$), while participants from other conditions declared lower level of such a motivation (respectively $M = 2.79, SD = 1.55$ for the communal condition and $M = 2.85, SD = 1.57$ for the neutral condition). In addition, the indicator of proportional thinking was significantly related to the participants' propensity to make utilitarian choices in the moral dilemma, Spearman's $\rho(369) = .16, p = .002$. This results initially supported our hypothesis that making utilitarian choices in moral dilemmas may be the consequence of the market mindset priming, because such a mindset triggers one's motivation to use proportional thinking, it is the motivation to use numbers and proportions while making decisions.

To further support this interpretation of results, we conducted a mediation analysis using Process 3.4 (Hayes, 2017) model 4 with 10,000 bootstrapping samples in order to demonstrate that the salience of the market mindset increases the tendency to make utilitarian choices by means of proportional thinking (Figure 6). The indicator-coded mindset manipulation served as an independent variable, choices in moral dilemma as a dependent variable, and indicator of proportional thinking as a mediator. While controlling for the proportional thinking, the direct effect of priming the communal mindset on utilitarian moral choices was not significant, $c_1': b = -0.09, se = 0.27, Z = -0.32, p = .749$, while the direct effect of priming the market mindset was significant, $c_2': b = 0.59, se = 0.29, Z = 2.08, p = .038$, as well as was the effect of the mediator, $b: b = 0.20, se = 0.07, Z = 2.78, p = .005$. The 95% bootstrapped confidence interval for the relative indirect effect from the communal relationships priming contained zero, 95% boot CI [-0.113, 0.075], suggesting the lack of indirect effect. The 95% bootstrapped confidence interval for the relative indirect effect from the market relationships priming did not contain zero, 95% boot CI [0.003, 0.225], confirming a significant mediation.

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Figure 6 about here

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In Experiment 4, we showed in a direct way that the motivation to use proportional thinking is involved in moral decision-making when people interpret their social environment consistently with the market mindset. The results we found in this study indicated that proportional thinking mediates the relationship between the activation of the market mindset and the tendency to make utilitarian choices in a moral dilemma. Importantly, our measure of proportional thinking did not regard any moral considerations. It means that even if the exposure to market relationships triggers the general motivation to use proportions and numbers, it still has the capacity to influence the manner people make their decisions in one specific domain, i.e., the moral domain.

Experiment 5

The results of the four experiments presented in previous sections demonstrated that proportional thinking which results from activating the market mindset has an impact of people's propensity to make moral choices in accordance with the utilitarian approach. However, even if the pattern of outcomes we reviewed so far seems to be consistent and valid, some alternative explanations can still be considered. The aim of the final, fifth study was to confront our original interpretation based on the effect of proportional thinking with other explanations referring to the potential role of suppressing both deontological reasoning and emotions as a result of the exposure to market relationships. Another goal of Experiment 5 was to document that proportional thinking which impacts moral choices may be considered as a part of people's broader orientation on rationality and logical considerations that originates from the market mindset.

In the present experiment, we further tested the causal effect of the market mindset on the preference of utilitarian moral choices, and mechanisms behind this effect that go beyond and are complementary to the specific role of proportional thinking. In particular, we explored here the effects of two such mechanisms: (1) suppressed deontological reasoning; and (2) suppressed emotions. We also directly examined the prediction outlined in our theoretical model that the motivation to use proportions in moral judgments and choices results from a more basic orientation on rationality active in people whose thinking is consistent with the market mindset.

The first prediction was based on recent debates in the field of moral psychology indicating that people's stronger inclination towards the utilitarian principle that is observed under certain conditions can, but does not have to, imply weaker inclination towards the deontological principle. That is, making decisions in line with the utilitarian principle does not imply that one acts simultaneously in opposition to the deontological principle (Conway & Gawronski, 2013; Greene,

Morelli, Lowenberg, Nystrom, & Cohen, 2008; Love, Salinas, & Rotman, 2020; Love, Staton, & Rotman, 2015). When interpreting the outcomes of Experiments 1-4, we concluded that our participants were more willing to make utilitarian choices after exposure to market relationships. However, we could only speculate about the degree to which the market mindset manipulation we used affected their deontological orientation. In Experiment 5, we aimed at investigating how both approaches to moral decision-making (utilitarian vs. deontological) operate when people are exposed to market relationships and whether an increased propensity to use proportions is accompanied by a weaker willingness to base moral considerations on different rules, with the latter being typical for the deontological principle (Conway & Gawronski, 2013).

The second prediction that was tested in Experiment 5 referred to the possibility that activating the market mindset hampers emotional processing and, in consequence, leads to a greater propensity to make utilitarian moral choices. The results of earlier research concerning the consequences of people's involvement in market relations indicate that these relations emphasize rationality and logical thinking—not intimacy or emotional connectedness (Jiang, Chen, & Wyer Jr., 2014; Ma-Kellams & Blascovich, 2013; Mead & Stuppy, 2014; Vohs, 2015). In other words, the more people stick to the market-type processing, the less they tend to rely on feelings. As deontological moral choices may be determined and directed by affective reactions (Bartels, 2008; Greene et al., 2001; Petrinovich & O'Neill, 1996; Starcke, Ludwig, & Brand, 2012; Strohminger, Lewis, & Meyer, 2011), we might presume that people exposed to market relations that have the capacity to impair emotions would become more willing to take the utilitarian position in their moral considerations. This would mean that the effect of suppressed emotions might explain the shift towards utilitarian choices in the market mindset condition in addition to, or even instead of, the effect of proportional thinking.

In Experiment 5, we not only tested different mechanisms to potentially explain the effect of the market mindset on utilitarian moral choices, but we also decided to change the design of the study and use another operationalization of the dependent variable to ascertain that the effects we found were not due to the specific procedures we used, but are robust across various methodological approaches. Here we again presented participants with a moral dilemma, but asked them to evaluate whether it was right or wrong to solve such a dilemma on the basis of comparing proportions, using specific rules, or acting on the basis of emotions. In addition, the participants were also requested to evaluate how right or wrong it was to solve the dilemma of interest on the basis of rational analysis. The latter factor was used in the model to document that

proportional thinking that mediates the link between the market mindset and utilitarian choices results from people's more general orientation towards rationality. In the present experiment, unlike in the previous studies, we did not ask participants to make decisions but instead presented them with information that somebody else made a utilitarian choice in the same scenario. The participants' task was to evaluate the extent to which they perceived such a choice as right or wrong.

To sum up, we hypothesized that people primed with the market mindset will evaluate the utilitarian option in the moral dilemma as more right than people in the neutral condition. We also predicted that this effect would be sequentially mediated by the perception of using rational thinking and proportions in solving the moral dilemma as right. More precisely, our hypothesis was that the market mindset priming (vs. neutral condition) will trigger the perception of using rational thinking as right, which will be positively related to the perception of using proportional thinking as right and, lastly, to seeing utilitarian choice as right. Additionally, we expected that the effect of the market mindset priming on the propensity to see utilitarian choices as right in the moral dilemmas would be mediated by the perception of using emotions and rule-based decision-making in solving the moral dilemma as right. The hypothesis was that the market mindset priming (vs. neutral condition) will hinder perception of using emotions in solving the moral dilemma as right and in turn, such hindered perception of using emotions as right will be related to greater propensity to see utilitarian choice as right. Furthermore, we expected that the market mindset priming (vs. neutral condition) would hinder perception of using rule-based decision-making as right, and this hindered perception of using rule-based decision-making as right will be related to greater propensity to see utilitarian choice as right. In our theoretical model, analogically to different dual models of information processing (Epstein, 1990; Kahneman, 2003), we assumed that even if relying on emotions and rational analysis may operate in parallel, they are alternative ways to solve moral problems.

For this experiment, we preregistered our hypotheses, experimental design, measures, analyses, sample size, and exclusions on <https://aspredicted.org/ny9ea.pdf>

Method

Participants and design

The results of a small meta-analysis presented in the previous experiment revealed that given an alpha of .05 and a conventionally assumed power of .80, a sample of 61 participants per condition would be required to detect the effect of a size similar to previous experiments. Since we

aimed at testing four mediators at one time, we decided to triple this number and recruit at least 183 participants to each experimental condition (366 participants altogether), and such number was preregistered.

We recruited 401 U.S. participants from Prolific Academic in exchange for £0.70 (232 women, 169 men; $M_{age} = 34.46$ years, $SD = 11.07$). Participants were randomly assigned to either the market mindset condition ($n = 198$) or neutral condition ($n = 203$). Collection of the data was not continued after data analysis. No data were discarded.

Procedure

First, participants were asked to provide an informed consent and answer demographical questions on gender and age. Then, they were presented with one of the two pictures showing two people facing each other, same as in the market mindset condition and neutral condition in previous experiments (see Figure 1). Similarly to previous experiments conducted in the present project, participants were asked to imagine a real-life situation such as the one presented in the picture, describe the presented picture in as much detail as possible, and answer three questions that served as a manipulation check presented in a random order (same as in Experiment 1).

Next, participants were asked to read a scenario presenting the moral dilemma chosen from the battery of classical dilemmas used earlier by Patil et al. (2018), same as in Experiment 4. After reading the scenario, participants were asked to indicate to what extent they thought it would be right if somebody made their decision on the following bases (presented to them in a random order): (1) “different emotions (positive, like joy or hope, and negative, like shame, guilt, or anxiety)”; (2) “the proportion of benefits to losses (number of victims saved vs. lost)”; (3) “rational reasoning and analytical thinking”; and (4) “specific rules that should always be followed (e.g. don’t kill anybody)”. For each item, participants were asked to provide their answers using a slider ranging from 0 = “definitely wrong” to 100 = “definitely right.” These four variables served as mediators, indicating participants’ perception of how right it was to use, respectively: (1) emotions; (2) proportional thinking; (3), rational reasoning, and; (4) rule-based decision-making, to solve the moral dilemma. These measures have been developed especially for the purpose of Experiment 5, but they were based on the classification of decision modes proposed earlier by Weber, Ames, and Blais (2005).

On the last screen, we informed participants that in our previous study we asked a group of MTurkers to read the same moral scenario and to declare their decision. Then, participants learned that we randomly chose the decision made by one of those MTurkers, and that this person decided

to send down the mine elevator to rescue the six miners at the bottom and crush one miner to death (i.e., made a utilitarian choice). Lastly, we asked participants to indicate the extent to which they perceived the decision made by the MTurker as right, using a slider ranging from 0 = “definitely wrong” to 100 = “definitely right.” This measure was based on some previous studies in the area of moral judgment (Haviv & Leman, 2002; Lind, 2008; Reniers, Corcoran, Völlm, Mashru, Howard, & Liddle, 2012) and served as our dependent variable indicating the acceptance for taking the utilitarian position in solving the moral dilemma of interest. Descriptive statistics, including means, standard deviations and correlations for mediators and dependent variable measured in Experiment 5, are presented in Supplemental Materials (Table S1).

Results and discussion

Manipulation check

As in previous four experiments, we conducted mixed ANOVA in order to examine the effect of mindset (market mindset vs. neutral condition) on participants’ answers to two questions on whether the interpretation of the picture was related to close and commercial/business relations. The type of question (concerning close vs. commercial relations) served as a within-subject factor, while the mindset manipulation was a between-subject factor. The analysis revealed a significant effect of the type of question, $F(1, 399) = 479.07, p < .001$, partial $\eta^2 = .546$, significant main effect of the mindset manipulation, $F(1, 399) = 36.73, p < .001$, partial $\eta^2 = .084$, and a significant interaction between both factors, $F(1, 399) = 506.22, p < .001$, partial $\eta^2 = .559$. Further analyses revealed that the description of the “pizza-for-money” picture was perceived as related to commercial relations ($M = 6.69, SD = 0.77$) to a greater extent than it was perceived as related to close relations ($M = 1.68, SD = 1.11$), $F(1, 197) = 2101.36, p < .001$, partial $\eta^2 = .914$. As previously, the description of the neutral picture was perceived as related to close ($M = 3.58, SD = 2.04$) and commercial relations ($M = 3.51, SD = 1.88$) to the same extent, $F(1, 202) = 0.12, p = .725$, partial $\eta^2 = .001$. These analyses confirmed that also in this experiment, the manipulation of the mindset was successful. Additionally, we again tested whether silhouettes presented in the pictures were perceived as being close to each other. Analysis of variance revealed significant main effect of the mindset manipulation, showing a pattern of results resembling the one that was observed in previous experiments, such that the silhouettes in the neutral picture were perceived as more close to each other ($M = 3.42, SD = 1.50$) than silhouettes in the “pizza-for-money” picture ($M = 2.00, SD = 1.26$), $F(1, 399) = 104.89, p < .001$, partial $\eta^2 = .208$. These results again

suggested that physical distance between the silhouettes did not impact the perception of them being close to each other.

Hypotheses testing

Before testing our hypotheses, we conducted MANOVA with market mindset manipulation as independent variable and participants' evaluations of using rational reasoning, proportional thinking, emotions, and rule-based decision-making as right bases for moral decision-making together with participants' evaluations of utilitarian choice as right as dependent variable. We observed a significant effect of market mindset, Wilks $\lambda = .958$, $F(5, 385) = 3.462$, $p = .004$, partial $\eta^2 = .042$. Further details of this analysis are presented in Table 1.

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Table 1 about here

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To test our research hypotheses, we conducted two types of analyses (both preregistered): (1) a regression analysis with the market mindset manipulation as the predictor and participants' evaluations of utilitarian choice as right as the dependent variable; and (2) mediation analysis aimed at testing whether the extent to which participants' evaluations of using rational reasoning, proportional thinking, emotions, and rule-based decision-making as right bases for moral decision-making mediated the relation between the market mindset priming and participants' perceptions of utilitarian choice as right. We examined a preregistered mediation model in which rational reasoning and proportional thinking were tested in sequential order, while emotions and rule-based decision-making served as parallel mediators. The mediation analysis was conducted using MPlus 8.0 and the MPlus syntax based on code for model 82 created by Stride, Gardner, Catley, and Thomas (2015). We employed path analysis to examine the hypothesized relationships among variables. Given that some variables were not distributed normally (e.g., high kurtosis and skewness), we used the robust full information maximum likelihood estimation method to estimate the model. We examined goodness of fit using multiple indices: the root mean square error of approximation (RMSEA) and its 90% confidence interval (90% CI), the standardized root mean square residual (SRMR), the comparative fit index (CFI), and the Tucker Lewis index (TLI). We used multiple fit indices because they assess different types of model fit (e.g., model parsimony, absolute fit), and provide a more reliable, conservative evaluation when used together (Brown, 2006). The model was evaluated with criteria proposed by Hu and Bentler (1999): The lower bound for an acceptable fit for CFI and TLI was .90, while the upper bound for an acceptable fit

for RMSEA and SRMR was .08. Indirect effects were tested by examining bootstrap confidence intervals for the indirect effects using bootstrap procedure with 10,000 samples.

First of all, regression analysis demonstrated that the market mindset manipulation had a significant and positive effect on participants' evaluations of utilitarian moral choice as right, $b = 7.28$, $se = 2.19$, $Z = 3.31$, $p = .001$, $R^2 = .026$ (RMSEA = 0, 0 SRMR = .001, TLI = 1, CFI = 1). After introducing four mediators to the regression model, with rational reasoning and proportional thinking tested in a sequential order, and emotions and rule-based decision-making as parallel mediators, and assuming that mediators that are not connected via structural path might be correlated, the model fit the data well in the light of some of the examined indices, but did not reach the lower bound for a good fit for RMSEA and TLI (RMSEA = .127, 90%CI [.072, .190], SRMR = .028, TLI = 0.743, CFI = 0.966). All the hypothesized path coefficients were significant, except for the paths between perception that basing decision on emotions is right and both the manipulation and the dependent variable (see Table S2 in Supplemental Materials for details). After excluding them from the model, it fitted the data well in the light of all examined indices (RMSEA = .068, 90% CI [.034, .104], SRMR = .034, TLI = 0.926, CFI = 0.966). The results (unstandardized path coefficients) for the two models are presented in Figure 7. The paths representing covariances between mediators are omitted for better readability, and the complete results of the final regression analysis are presented in Table S2 in Supplemental Materials. The manipulation and mediators accounted for $R^2 = .41$ of the variance of participants' evaluations of a utilitarian choice as right.

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Figure 7 about here

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We also examined total, direct, and indirect effects of the market mindset manipulation on the dependent variable in a more parsimonious model. The total effect was significant and positive (effect = 5.46, $se = 1.95$, $Z = 2.80$, $p = .005$, 95% boot CI [1.586, 9.271]). The total indirect effect was also significant (effect = 2.26, boot $se = 0.82$, $Z = 2.76$, $p = .006$, 95% boot CI [0.84, 4.05]). Further investigation of the specific indirect effects revealed that the indirect path through perception of basing decision on rational thinking and proportional thinking as right was significant (effect = 1.52, boot $se = 0.70$, $Z = 2.16$, $p = .031$, 95% boot CI [0.34, 3.10]). The indirect path through perception of basing decision on specific rules was marginally significant, however the confidence interval did not include 0, suggesting the presence of the indirect effect

(effect = 0.73, boot *se* = 0.41, *Z* = 1.81, *p* = .071, 95% boot CI [0.12, 1.78]). The direct impact of the market mindset manipulation on the DV (controlling for indirect effects) was marginally significant and the confidence interval included 0 (effect = 3.20, boot *se* = 1.68, *Z* = 1.90, *p* = .057, 95% boot CI [-0.17, 6.47]).

To conclude, we showed that when people are exposed to market relationships, they tend to not only make utilitarian moral choices but also to perceive such choices made by others as right. In other words, the market mindset makes individuals favor the utilitarian position in solving moral dilemmas and actively follow it in their decision-making. We were also able to again support our thesis that the shift towards the utilitarian approach in moral choices caused by activating market mentality is due to the fact that this specific mindset strengthens the motivation to base moral considerations on proportional thinking. What is more, we provided evidence that using proportional thinking in the moral context can be considered as a part of a more general process, the meaning of which is that the activation of the market mindset triggers people's acceptance for rationality and analysis as proper fundamentals for moral reasoning.

In this experiment we also examined the potential effects of other psychological mechanisms that could explain why the market mindset leads to the preference for the utilitarian position in moral choices. We did not find support for the alternative interpretation that people become more willing to take the utilitarian position in their moral considerations due to the fact that exposure to market relations decreased participants' belief that it is right to base moral decisions on emotions. However, we showed that an increased propensity to make utilitarian choices after the market mindset priming is accompanied by a decreased readiness to base moral decisions on specific rules. Such a pattern of outcomes might suggest that the market mindset parallelly strengthens the utilitarian position and weakens the deontological position. However, because the indirect effect of basing moral choices on rules was less pronounced than the indirect effect of basing moral choices on proportional thinking, the above presented explanation definitely requires further empirical investigation.

General Discussion

Relational models theory (Fiske, 1991, 2004) postulates that the market mindset, activated when people engage in market relationships, promotes thinking with reference to ratios and cost/benefit analyses. On this basis, Rai and Fiske (2011) proposed that the core moral motive in the market pricing model is proportionality. In the present project we examined the hypothesis that when people's thinking is determined by the market mindset, they tend to endorse utilitarian moral

reasoning and, as a consequence, make more utilitarian choices when solving moral dilemmas. Such a hypothesis is consistent with theorizing suggested earlier by Fiske (2004) that market pricing involves evaluating the aggregate welfare in terms of the greatest good for the greatest number. What is more, we proposed that even merely exposing people to market relationships is enough to have a positive effect on the endorsement of utilitarian choices, because activating the market mindset evokes thinking based on ratios. We carried out a series of five experiments in order to test this hypothesis.

In Experiment 1 we found that participants who were exposed to market relationships made more utilitarian choices in both the trolley (i.e. impersonal) dilemma and the bridge (i.e. personal) dilemma than those in the neutral condition. In other words, the effect of the market mindset priming on participants' acceptance of killing one individual in order to save lives of five others was not moderated by the type of moral dilemma. In turn, exposure to communal relationships did not have any effect on participants' choices. In following experiments, we investigated the psychological mechanism behind the association between the market mindset and utilitarian moral choices, i.e., proportional thinking sensitive to ratios and rates. In Experiment 2, we manipulated the ratio between numbers representing how many people will survive and how many people will die to show that participants exposed to market relations were more responsive to the proportions present in moral dilemmas than those in the non-market condition. In line with our assumptions, the number of utilitarian choices made by participants in the market mindset increased when the survival rate was greater, while the number of such choices made by participants in the communal mindset was not affected by the survival rate. In Experiment 3, we predicted that exposure to market relations (vs. neutral condition) would increase the proportion of utilitarian choices when the number of potential victims is clearly stated, but at the same time, it would not lead to utilitarian decision-making when information about the number of potential victims is only vaguely provided. The results of this experiment supported our prediction. We claim that this is because the market mindset is closely associated with proportional thinking, which relies on comparing numbers. In Experiment 4 we demonstrated that the state motivation to use proportional thinking mediates the relationship between the market mindset (but not communal mindset) and utilitarian moral choices. The results of this study may be interpreted as a direct evidence of the causal impact of the market mindset on utilitarian moral choices by means of proportional thinking. Lastly, in Experiment 5, we showed that the motivation to use proportional thinking in moral decision-making is rooted in a more general orientation for rational

processing evoked by the exposure to market relationships and that the effect of the market mindset on utilitarian moral choices is not due to fact that the former reduces one's belief that it is right to base moral decisions on emotions. In this final experiment, we also found that the activation of market mentality impacts people's evaluations of how much it is right to take the utilitarian position in moral decision-making.

The main purpose of this project was to demonstrate that the increasing prevalence of market-like practices and the growing tendency to perceive social relations through market-oriented lenses might cause people to behave as if they were utilitarians when making moral decisions. We proposed that the market mindset facilitates utilitarian choices because its central psychological characteristics refer to rational processing and proportional reasoning (Fiske, 2004; Rai & Fiske, 2011). Indeed, prior research on moral judgment and decision-making has already indicated that the shift toward the preference of utilitarian moral philosophy might be either related to or causally provoked by analytical thinking. The first group of studies in that area (Patil et al., 2018; Pennycook, Cheyne, Barr, Koehler, & Fugelsang, 2014; Ward & King, 2017) suggests that individual differences in the willingness to make utilitarian moral choices are associated with individual differences in cognitive abilities or cognitive styles. The second set of studies indicates that directly inducing analytical thinking through experimental manipulation makes people more likely to admit they would cause harm when necessary to produce greater general welfare (Cummins & Cummins, 2012; Greene, 2007; Hayakawa, Tannenbaum, Costa, Corey, & Keysar, 2017; Li, Xia, Wu, & Chen, 2018; Paxton, Ungar, & Greene, 2012; Suter & Hertwig, 2011). The theoretical contribution of our experimental project was to show that thinking about one's social environment consistently with the market mindset might be another substantial factor in moral decision-making. A definitional attribute of the market mindset is proportional thinking, because it advances calculations and the cost/benefit assessments making the process of trade efficient and fluent (Fiske, 2004; Fiske & Haslam, 2005). Interestingly, as we documented in the present paper, pragmatic and trade-oriented characteristics of the market mindset might also regulate moral choices and make decision makers more willing to accept sacrificing something for the greater good, but only when proportions of victims and survivors or losses and gains are known as precise numbers.

The present paper not only shows the existence of the link between market-type thinking and moral decision-making, but it also indicates that the consequences of thinking consistently with the market mindset go beyond simply thinking in terms of money. Market relationships often

involve money as an easy means of calculating and expressing value and, as Fiske and Haslam (2005) put it, “money is precisely the abstract representation of the ratio value of every commodity in proportion to all others” (p. 271). But market or exchange relationships may also exist without money being involved if prototypical characteristics of these relationships are present (e.g., acting in accord with ratios or rates or contingent helping) (Clark & Mills, 1993, 2012). Results of Experiment 2 documented that the exposure to market relationships increased the tendency to make utilitarian choices irrespectively of whether money was exhibited or not. This means that the utilitarian approach to moral decision-making may be activated when people’s thinking is consistent with the market mindset even if money is absent (e.g., when relations within a family mirror typical exchange system).

In both our theoretical model and its empirical examination, we mainly focused on how the market mindset impacts utilitarian moral choices. The way we measured moral choices in this project might, at first glance, suggest that the increase in utilitarian choices is inevitably associated with the decrease in deontological choices. As we have already pointed out earlier in this paper, the dual-process model (Greene, 2014; Greene et al., 2004, 2001) assumes that moral decision-making is supported by two systems: (1) the deliberative reasoning system promoting utilitarian processing; and (2) the affective and automatic system favoring deontological processing. However, recent advances in theorizing on the psychology of moral judgment and decision-making (Conway & Gawronski, 2013) have proposed that the two systems function independently and do not have to be inversely related to each other. The results of Experiment 5 demonstrated that, in line with the above-outlined theoretical argumentation, the positive relation between the market mindset and utilitarian choices was mediated not only by proportional thinking, but also—to a smaller extent—by using normative rules as a wrong method of making moral decisions. Taking into account that the effect of the market mindset on utilitarian choices was sequentially mediated by the perception of using both rational thinking and proportions as right, we might speculate that the propensity to solve a moral dilemma in an analytical way (i.e., by comparing costs and benefits) is also accompanied by the suppressed tendency to apply simple normative rules (e.g., don’t kill anybody) which reflects an intuitive, deontological approach towards moral decision-making. In other words, the results observed in Experiment 5 might indicate that activating market mentality not only strengthens the utilitarian position, but parallelly also weakens the deontological position in moral decision-making.

In the final part of the present project we also examined the potential role of emotions in the relation between the market mindset and utilitarian moral choice. Even if prior research suggests that people's involvement in market relationships hampers feelings (Jiang, Chen, & Wyer Jr., 2014; Ma-Kellams & Blascovich, 2013; Mead & Stuppy, 2014; Vohs, 2015), we did not find the support for the hypothesis that the evaluation of using emotions to solve moral dilemmas as improper mediates the link between market mentality and utilitarian decision-making. This result seems to additionally bolster our theoretical assertion that it is proportional thinking that plays a critical role in how people make their moral decisions when market-type reasoning is activated.

Limitations

Our findings should be interpreted with certain limitations and future research directions in mind. Firstly, all assessments in the current project were self-reports, and we used the online panels (Amazon Mechanical Turk and Prolific) to recruit the participants in all experiments. Although the quality of data obtained from online labor markets has been questioned, research suggests that, in terms of internal consistency and test-retest reliability, data collected on either MTurk or Prolific is comparable to data collected via traditional methods (Buhrmester, Kwang, & Gosling, 2011). The finding that online panels are a valid means of collecting data seems to be robust (Mason & Suri, 2012). However, since our studies relied on self-reports concerning hypothetical relationships—mostly depicted by simple figures or stories—it is uncertain to what extent they represent actual moral choices made in real-life. For that reason, even if we presented consistent and robust effects, we still see the need to conceptually replicate our results using behavioral measures in externally valid contexts.

In the present project we measured moral reasoning indirectly, by focusing on the participants' behavioral intentions (e.g. declared willingness to pull the lever in the trolley dilemma). Behavioral intentions could be affected by a variety of factors, such as norms or perceived behavioral control over the situation. Future studies should address this issue by using more direct or naturalistic measures of moral judgment and decision-making. For example, participants might be involved in a task in which they would be tempted to cheat (i.e., to violate moral rules and make unethical choices) in order to earn more money for themselves (Gino & Pierce, 2009; Mazar, Amir, & Ariely, 2008).

Another limitation of the present research is that all experiments were conducted with U.S. samples, which represent a typical WEIRD (Western, Educated, Industrialized, Rich, and Democratic) society (Henrich, Heine, & Norenzayan, 2010). As Fiske (1992) put it in one of his

seminal papers, “Market pricing is so pervasive in Western society and so important in the Western cultural conceptions of human nature and society that many theorists have postulated that all human social behavior is based on more or less rational calculations of cost-benefit ratios in self-interested exchange” (p. 706). In this context, it is possible that activating the market mindset and investigating its effects on moral choices may be much easier to observe in Western societies oriented on strictly economic exchange than in collectivistic societies in which communal sharing values are stronger and more common. Therefore, although the connection between the market mindset and proportionality seems to be universal, we believe that an attempt to replicate our findings on different samples—especially those coming from less market-oriented societies—would be worthwhile.

In our studies, we used only a limited number of scenarios that require moral decision-making. This reduces generalizability of the findings to other situations and makes it difficult to predict choices made in a broader set of everyday moral dilemmas. Further studies might expand the number and type of scenarios used.

Lastly, in Experiment 5, we examined whether people’s willingness to make utilitarian choices after being exposed to market relationships is determined not only by an increased motivation to use proportional thinking, but also—to some extent—by a decreased propensity to base decisions on simple rules. However, the results concerning the indirect effect of people’s perceptions of basing moral decisions on rules were not as clear as the results related to the indirect effect of proportional thinking, which means that this part of our project also requires further investigation.

Concluding Remarks

Being part of a market society, many people experience how market-oriented mentality expands into different social spheres. One such sphere is moral judgment and decision-making. In the present paper, we showed that when people are exposed to market relationships, they become more prone to base their considerations on proportionality, which brings them closer to the utilitarian position in their moral judgments and choices. Our research documented that thinking consistent with the market mindset not only makes people more open to utilitarian decision-making, but also makes them perceive such a manner of making moral decisions by others as right and acceptable.

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Conflict of Interest Statement:

The authors confirm they have no conflict of interest to declare. Authors also confirm that this article adheres to ethical guidelines specified in the APA Code of Conduct as well as the authors' national ethics guidelines.

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Tables

Table 1. The effect of market mindset on mediators and dependent variable in Experiment 5.

| Variable | Neutral condition | | Market condition | | <i>F</i> | <i>p</i> | partial η^2 |
|--|-------------------|-----------|------------------|-----------|----------|----------|------------------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | |
| Perception of using emotions as right | 48.04 | 24.38 | 51.33 | 26.69 | 1.66 | .198 | .004 |
| Perception of using proportional thinking as right | 70.11 | 23.76 | 75.62 | 19.36 | 6.47 | .011 | .016 |
| Perception of using rational reasoning as right | 77.23 | 19.90 | 81.63 | 16.28 | 5.87 | .016 | .014 |
| Perception of using specific rules as right | 68.94 | 25.43 | 63.21 | 24.21 | 5.33 | .022 | .013 |
| Perception of making utilitarian decision as right | 61.26 | 24.67 | 68.53 | 19.40 | 10.74 | .001 | .026 |

Figure captions

Figure 1. Pictures used to induce a specific mindset. Picture A was shown in the market mindset condition. Picture B was shown in the communal mindset condition. Picture C was shown in the neutral condition.

Figure 2. Pictures presented together with the moral dilemmas in Experiment 1. Picture A depicts a symbolic representation of the trolley dilemma. Picture B depicts a symbolic representation of the footbridge dilemma.

Figure 3. The proportion of utilitarian choices in Experiment 1 depending on the primed mindset in both personal (footbridge) and impersonal (trolley) dilemma. Error bars are standard errors of the proportions.

Figure 4. The proportion of utilitarian choices depending on the primed mindset and the number of victims (Experiment 2). Error bars are standard errors of the proportions.

Figure 5. The proportion of utilitarian choices in Experiment 3 depending on the primed mindset and the way information about potential victims was presented (specified vs. unspecified). Error bars are standard errors of the proportions.

Figure 6. Mediation effect of communal and market relationship through proportional thinking on utilitarian moral choices. Unstandardized regression coefficients. * $p < .05$, ** $p < .01$. Values in parentheses represent regression coefficient while controlling for potential mediator.

Figure 7. Mediation effect of market relationship through perception of rational reasoning, proportional thinking, emotions, and rule-based decision-making as right on perception of utilitarian moral choice as right. Unstandardized regression coefficients. † $p < .1$, * $p < .05$, ** $p < .01$. The upper panel presents the results of SEM (including insignificant paths), while the lower panel presents the results without these paths. Values in parentheses represent regression coefficient while controlling for potential mediators. Paths representing covariances between mediators are omitted for better readability.

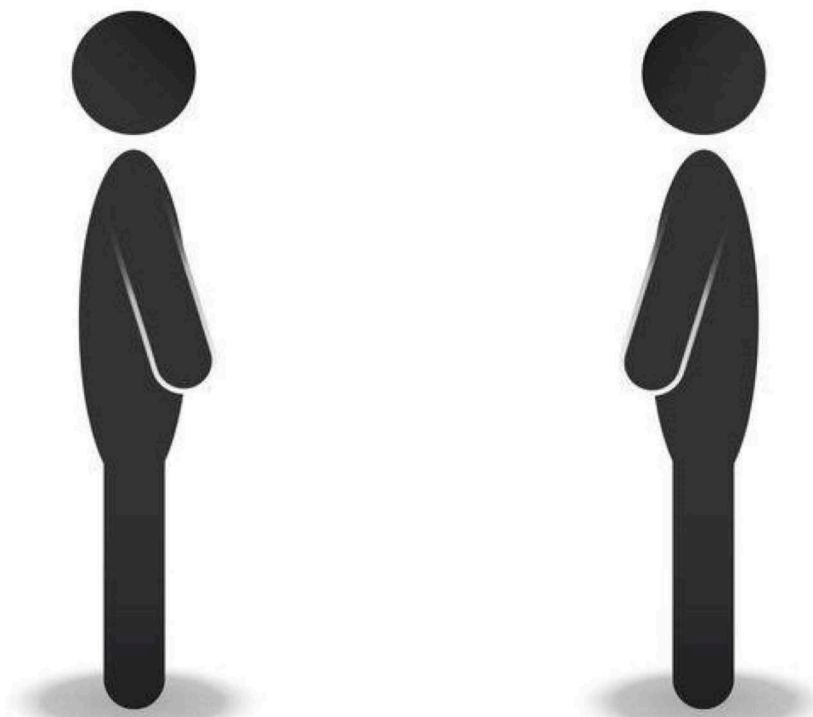
A



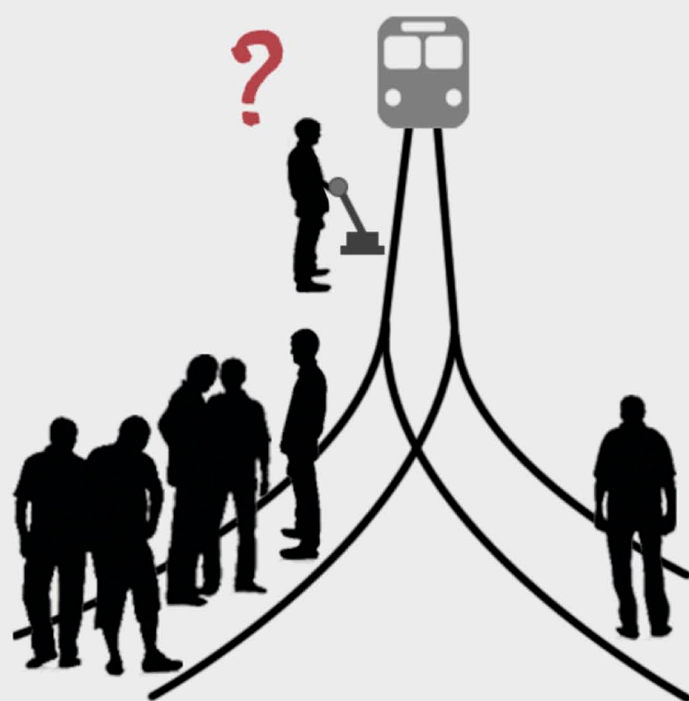
B



C



A



B



