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The Role of Framing Effect and Social Value Orientation in Cooperation in Repeated Social Dilemmas

El Papel del Efecto de Encuadre y la Orientación del Valor Social en la Cooperación en Dilemas Sociales Repetidos

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The research in the area of framing effect has thoroughly addressed the question whether individuals cooperate more in negatively framed situations than in positively framed situations. However, so far, the studies brought inconsistent results. In the present study, it is hypothesized that the effect of framing on cooperative behavior depends on person's social value orientation. 79 Slovak university students (19 men, 60 women) divided into five small social groups were presented with a decomposed game to measure their social value orientation. Then, they cooperated in 9 repeated decisions within 2 different social dilemmas about the distribution of the financial resources. After each decision, either negatively or positively framed information was provided about how the groups' financial resources were affected. The results of the semi-robust two-way MANOVA showed that framing effect did not significantly affect cooperation, but social value orientation did. Importantly, social value orientation did not moderate the effect of framing on cooperation. The findings indicate the need for further examination of other possible factors, such as emotions, that may moderate or mediate the effect of framing on cooperation.

Keywords: framing effect, social value orientation, cooperation, experiment, Slovakia

La investigación en el área del efecto de encuadre ha abordado minuciosamente la pregunta sobre si los individuos cooperan más en situaciones enmarcadas negativamente que en situaciones enmarcadas positivamente. Sin embargo, hasta ahora los estudios han arrojado resultados inconsistentes. En el presente estudio se formula la hipótesis de que el efecto del encuadre sobre el comportamiento cooperativo depende de la orientación de valores sociales de la persona. A 79 estudiantes universitarios eslovacos (19 hombres y 60 mujeres) divididos en cinco pequeños grupos sociales se les presentó un juego descompuesto para medir su orientación de valores sociales. A continuación, cooperaron en 9 decisiones repetidas dentro de 2 dilemas sociales diferentes sobre la distribución de los recursos financieros. Después de cada decisión, se proporcionó información enmarcada negativa o positivamente sobre cómo se vieron afectados los recursos financieros de los grupos. Los resultados del MANOVA semi-robusto de dos vías mostraron que el efecto de encuadre no afectó significativamente la cooperación, pero sí lo hizo la orientación de valores sociales. Además, la orientación del valor social no moderó el efecto del encuadre sobre la cooperación. Los hallazgos indican la necesidad de un examen más detenido de otros posibles factores, como las emociones, que pueden moderar o mediar el efecto del encuadre en la cooperación.

Palabras clave: efecto encuadre, orientación a valores sociales, cooperación, experimento, Eslovaquia

To understand the dynamics of human cooperation in repeated social interactions, scholars often use social dilemmas in which individual's own interests are at odds with collective interests (Przepiorka et al., 2021; Van Lange et al., 1992). A considerable body of literature suggests that the level of cooperation in these situations is often affected by framing effect (Gerlach, 2017). These studies are based on a notion that the way in which a situation is presented affects a persons' willingness to cooperate. However, inconclusive findings show strong, mixed, or no support for the effect of framing on cooperation. Most importantly, despite

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a few attempts to explain these inconclusive outcomes, the literature on explaining this heterogeneity is still scarce (De Dreu & McCusker, 1997).

Our study aimed to explain the ambiguous effect of framing on cooperation in repeated social interactions using findings from the social value orientation literature. The research on social value orientation shows that human beings systematically differ in how they weight the outcomes for themselves and others in social interactions. This individual trait has been shown to be an important determinant of cooperative behavior in various situations and contexts (Pletzer et al., 2018). Yet, only limited number of studies tried to explain the relationship between framing effect and cooperation using social value orientation. Based on reciprocity theory (Berg et al., 1995; Fehr & Gächter, 2000; McClintock & Liebrand, 1988; Parks & Rumble, 2001; Weingart et al., 2007) and justice theory (Atilgan, 2017; Atilgan & Markovsky, 2021), we argue that, in repeated social interactions, framing effect matters mostly for prosocials, but not for proselfs. The main aim of our study was, therefore, to investigate the moderating role of social value orientation on the relationship between framing effect and cooperation in repeated social interactions.

Theoretical Background

The Definition and Taxonomy of Framing Effect

The theory of framing effect is based on a notion that the choice of a person is often affected by the way it is presented, in the sense that even two equivalent choices may elicit singular responses when presented differently (Gerlach, 2017). As Columbus et al. (2020) suggest, the framing effect encompasses various manipulations with one common attribute—the deep structure (explicit features, like the actual payoffs) of the information remains the same, while only the surface structure (implicit features, like how the situation is labelled) is manipulated—. The lack of consensus in operational, methodological, and task-specific features of framing effect in research has brought about contradictory results, deriving in a difficulty in integrating findings. Consequently, there have been several attempts to provide integrative taxonomies distinguishing diverse manifestations of the framing effect (e.g., Druckman, 2001; Gerlach & Jaeger, 2016; Levin et al., 1998; Wang, 1996).

Gerlach and Jaeger (2016) distinguish three main constructs of the framing effect: focal points framing, valence framing, and context framing. The first refers to situations in which people have to coordinate their actions to achieve higher payoffs. In such situations, differently framed information induces certain focal points, which help individuals to make similar but principally arbitrary actions leading to a better cooperation and higher payoffs.

The second construct described by Gerlach and Jaeger (2016) is the valence framing effect (also called the equivalency framing, Druckman, 2001). It refers to situations in which certain information is presented in different ways, either positively or negatively. In their pioneering study, Tversky and Kahneman (1981) explored how the presentation of information affects people's decision-making and found that persons tend to avoid risk when information is presented in a positive frame (i.e., gain or survival), but seek risk when a negative frame is provided (i.e., loss or mortality). Studies involving cooperation (e.g., Rutte et al, 1987; Suvoy, 2003; Van Lange & Liebrand, 1989) adopted this type of framing in a way that they frame the situation either as a "give-some situation" (giving own resources to provide public good) or "take-some situation" (taking resources from an already present public good).

The third construct described by Gerlach and Jaeger (2016) is the context framing (also called the emphasis framing effect or social framing, Dreber et al., 2013; Druckman, 2001). This type is based on the idea that by emphasizing a subset of potentially relevant considerations about an object or event, a speaker can cause people to focus on these considerations (e.g., framing political campaign in economic terms or foreign affairs policy). Unlike the valence framing, the frames and words used in communication are not identical. Instead, the speaker tries to focus on specific potentially relevant considerations—and omit others—and in this way shape opinions and decisions of other people (Chong & Druckman, 2013). The studies on cooperation often use this type of framing to manipulate how the situation is presented, like emphasizing the competitive nature of the situation, highlighting the advantages of cooperation, or stressing the dependency of the individuals in non-interactive games (Brañas-Garza, 2007; Gerlach & Jaeger, 2016).

Framing Effect and Interpersonal Cooperation

There has been a considerable body of research focusing on how framing effect shapes interpersonal cooperation. Based on the valence framing framework, the extant research using social dilemmas has addressed the question of whether individuals cooperate more in the negatively framed situations than in the positively framed situations (Fosgaard et al., 2017; Goerg et al., 2020). Studies using context framing, in turn, have examined whether the way a social dilemma situation is labeled (e.g., social exchange versus economic game) affects cooperation (Bernold et al., 2015, Ellingsen et al., 2012; Eriksson et al., 2017; Tappin & Capraro, 2018; Capraro & Vanzo, 2019). Importantly, research from both of these streams has led to inconsistent results. Numerous studies report that people who encounter negatively framed situations or situations labelled in a way that it did not elicit cooperation, cooperate less compared to people who encounter positively framed situations (e.g., Andreoni, 1995; Balbo et al., 2015; Batson & Moran, 1999; Böhm & Theelen, 2016; Brewer & Kramer, 1986; de Heus et al., 2010; Ellingsen et al., 2012; Eriksson & Strimling, 2014; Fosgaard et al., 2019; Junjun et al., 2017; Komorita & Carnevale, 1992; Macoveanu et al., 2016; McCusker & Carnevale, 1995; Mieth et al., 2021; Pillutla & Chen, 1999; Sonnemans et al., 1998). Contrary to these findings, several authors find no, very little, or mixed effects of framing on social cooperation (e.g., Atilgan, 2017; Bernold et al., 2015; Chowdhury et al., 2017; Cochard et al., 2020; Cox, 2015; Cox & Stoddard, 2015; De Dreu et al., 1992; Dreber et al., 2013; Fleishman, 1988; Gächter et al., 2017; Goerg & Walkowitz, 2010; Grossman & Eckel, 2015; Mann et al., 2020; Meier, 2006; Rutte et al., 1987; Suvoy, 2003).

Interestingly, only a limited number of empirical studies have sought to clear up contradictory results through examining other exploratory variables affecting the relationship between framing and cooperation, like affective states (Brown, 2006; Carnevale, 2008) or dark triad characteristics (Deutchman & Sullivan, 2018). Our study aims to contribute to this area, by including social value orientation (SVO) as an exploratory moderating variable of the relationship between framing effect and cooperation. In the next sections, we define this characteristic and focus on how it interacts with the framing effect to shape cooperation in repeated social interactions.

Social Value Orientation and Cooperation

Theories of SVO (e.g., Kuhlman & Marshello, 1975; Messick & McClintock, 1968; Van Lange & Kuhlman, 1994) are based on the idea that when we distribute some valuable resources, our SVO affects how we weight the outcomes for ourselves and others; based on this weighing, we distribute these resources (Ackermann et al., 2016). An often cited pioneering definition of Messick and McClintock (1968) considers SVO as a stable disposition to prefer certain patterns of outcomes of social interactions for ourself and others.

In the literature, scholars often distinguish three types of SVO (e.g., Lewis & Willer, 2017; Murphy & Ackermann, 2014; Pletzer et al., 2018). These types differ according to what decision-making strategies are preferred when distributing outcomes between ourself and others in a social interaction. Cooperatives, often called prosocials, tend to maximize the joint outcomes and minimize the outcome difference between ourself and others. Individualists tend to maximize the outcome to themselves with little or no regard for others. Finally, competitives tend to maximize their outcomes but also seek to maximize the relative difference between their own and others' outcome (Eek & Gärling, 2008). Numerous authors lump competitives and individualists into one category, distinguishing between two types of SVO: cooperatives/prosocials and noncooperatives/proselfs (e.g., Atilgan & Markovsky, 2021; Beggan et al., 1988; Bernold et al., 2015; Bieleke et al., 2017; Kelley & Stahelski, 1970; Liebrand, 1984; Pavitt et al., 2009; Qi et al., 2018; Van Lange & Kuhlman, 1994).

In the literature, SVO is often presented as an explanatory factor of the differences in cooperation in various social dilemmas. Many studies have shown that, overall, prosocials cooperate more than proselfs in social dilemmas (e.g., Allison & Messick, 1990; Anderson & Patterson, 2008; Atilgan & Markovsky, 2021; Balliet et al., 2009; De Cremer, 2000; Mill & Theelen, 2019; Pletzer et al., 2018; Simpson & Willer, 2015; Van Lange & Liebrand, 1989). A meta-analysis of 82 studies by Balliet et al. (2009) showed a significant and small to medium effect size of SVO on cooperation in social dilemmas, confirming that, in general, SVO can be perceived as a significant predictor of cooperation.

Social Value Orientation, Framing Effect, and Cooperation

Despite the long research history of SVO, few authors have attempted to investigate it as an explanatory variable of the ambiguous effect of framing on social cooperation. Moreover, the limited number of studies do not provide consistent findings on this matter. De Dreu and McCusker (1997) focused on how framing affects cooperation of people with different SVO. In their first study, they manipulated framing, by including positively and negatively framed condition of a social dilemma. In the positively framed condition, participants were told that they had 0 points at the beginning, but that they can earn up to 22 points by making decisions. Participants in the negatively framed condition were told that they had 22 points at the beginning of the social dilemma and that they would lose points by making decisions. The study found a significant interaction between framing effect and SVO. Prosocials tended to cooperate more when the outcome was negatively framed than when it was positively framed, but the difference was not significant. In contrast, proselfs cooperated significantly less in a negative frame condition than in a positive frame condition. In the following second and third study, De Dreu and McCusker (1997) used the same methodology, but used additional framing manipulation. They created prosocial and individualistic framing conditions by manipulating information about how participants' earnings would be calculated. In prosocial situation, participants were told that their earnings would be based on their own points and those of the other party. In individualistic condition, they were told that their earnings would be calculated regardless of the points of other party's members. They found that prosocials cooperated more in a negative frame condition and individualists cooperated less in a negative frame condition.

The results of De Dreu and McCusker (1997) were supported in the meta-analysis by Balliet et al. (2009), who found that the effect of SVO was greater in negatively-framed dilemmas than in positively-framed dilemmas. Another study by Chen (2010) partly supported findings of De Dreu and McCusker (1997) in the context of dyadic negotiating situations. They found that, during negotiation, collaborative dyads exhibited greater cooperation and reached better outcomes in the negative frame, while competitive dyads cooperated more in the positive frame. Unfortunately, individuals' actual SVO was not measured. Finally, the study by Brown (2006) included a measure of SVO to control for its impact on the effect of framing on social cooperation. Unexpectedly, SVO was unrelated to a person's level of cooperation. However, this study used a self-report measure for SVO instead of observing real decisions or the cooperative behavior of participants (e.g., using a widely used decomposed game). As Brown (2006) suggested, it is not clear whether the self-report measure assessed a different construct or there were other situational factors that could explain the non-significant effect of SVO.

It is important to note that the discussed studies fairly differ in the methodology and they do not address how the relation between framing and SVO occurs in repeated social interactions. To fill this gap, in the following section we combine findings from reciprocity research and distributive justice theory to reason about how prosocials and proselfs may differ in how they cooperate over repeated interactions.

Social Value Orientation and Cooperation in Repeated Social Interactions

Compared to one-shot social dilemmas, iterated social dilemmas allow observing whether individuals' cooperative preferences are stable over repeated social interactions. The important finding brought by the research on reciprocity is that cooperative preferences of prosocials are more volatile than those of proselfs (see Ackermann et al., 2016; Bieleke et al., 2017; Falk & Fischbacher, 2006; Parks & Rumble, 2001). As we stated before, proselfs tend to use individualistic strategies most of the time with no regard to their partner's actions. They cooperate only in situations when the cooperation guarantees a higher outcome for them than the individualistic strategy (Beggan et al., 1988; Kelley & Stahelski, 1970; McClintock & Liebrand, 1988). This is not, however, the case of prosocials. Unlike proselfs, they tailor their cooperative preferences according to a situation (Parks & Rumble, 2001). In the initial social interaction, prosocials start to cooperate to maximize the joint gain and to inspire partners to cooperate as well. However, if they realize that partners do not reciprocally cooperate, they quit cooperating and change their decision-making strategy and eventually become non-cooperative as well. In other words, as time goes on and the social interaction is repeated, prosocials lose their patience with uncooperative others and start acting selfishly as well (Parks & Rumble, 2001). Importantly, they assimilate their behavior, because they interpret selfish behavior as a hostile act and they want to punish proselfs by free-riding too (Fehr & Gächter, 2000; Parks & Rumble, 2001).

The findings on behavioral assimilation are in line with the distributive justice theory (see Kaufman, 2012; Kazemi et al., 2015; Markovsky, 1985). The theory is based on a notion that, in situations that include resource distribution, like social dilemmas, individuals tend to form fairness judgments about the actual distribution, by comparing it to the reference conditions, such as their beliefs and expectations about how the resource should be distributed. If the actual behavior and reference conditions do not match and people evaluate the distribution as unfair, they experience emotional distress and feel the injustice. Importantly, they tend to restore the justice and achieve fairness in the following interactions by altering their behavior, like quitting cooperation, leaving the situation, or trying to punish the distributor (Atilgan, 2017).

The Interaction of Framing Effect and Social Value Orientation in Repeated Social Interactions

To explain the possible interaction between framing effect and SVO in repeated social interactions, Atilgan & Markovsky (2021) integrated research on framing effect with distributive justice theory. They postulated that individuals' justice evaluations about the resource distribution are shaped by the way information on distribution is framed. As noted, "justice perceptions can be context-specific, where social cues can determine which social comparisons will become more salient and impactful, thus shaping the individual's overall evaluations" (Atilgan & Markovsky, 2021, p. 2). In other words, providing positively framed information emphasizing cooperation may promote the actual cooperative behavior. On the other hand, providing negatively framed information that points to the individualistic behavior may result in a decay of cooperation.

In our research study, we further develop Atilgan and Markovsky's (2021) theory, by suggesting that the cooperative behaviour of prosocials in repeated social interactions is shaped by framing effect more than the cooperative behavior of proselfs. We can illustrate the rationale for this can be illustrated in the following example. Let's assume that several persons are included in a small social group and repeatedly decide about how much resource they contribute to the common public goods. This group includes both prosocials and proselfs. In the initial interaction, SVO will affect the first contribution. Specifically, proselfs will contribute significantly less resource than prosocials, because they mostly choose the strategy that provides the highest utility for them, irrespectively of the situational context. Prosocials, on the other hand, naturally tend to maximize the joint outcomes and aim to convince others to cooperate by contributing a high amount of resources (Eek & Gärling, 2008; Parks & Rumble, 2001).

For the sake of this example, let's also assume that, after each contribution, the group receives either positively or negatively framed information about how much resource has been contributed. The positively framed information focuses on the actual cooperation. It shows increase of the common group resources, emphasizes the importance of cooperation, or praises those that contributed an above average resource. The negatively framed information, on the other hand, focuses on how much private resource people sacrificed or how many individuals contributed with a below average resource. After receiving information, in the second and following interactions, proselfs should still tend to act individualistically and contribute only limited resources (Beggan et al., 1988; Kelley & Stahelski, 1970; McClintock & Liebrand, 1988). However, in the case of prosocials, negatively framed information may trigger the behavioral assimilation. Highlighting individualistic behavior may activate the comparison that, despite their high initial contribution, there are persons acting selfishly and cooperation is not reciprocated in an expected way. In result, this may elicit the feeling of injustice and the desire to punish others, by lowering the cooperation in following interactions (Atilgan & Markovsky, 2021).

Our Study

In our study, we aimed to test our above mentioned assumptions by investigating the moderating role of SVO on the relationship between framing effect and cooperation in repeated social interactions. We expected that the framing effect does not significantly affect the cooperative behavior of proselfs, but it does affect prosocials. We assumed that providing positively framed information fosters the cooperative behavior and negatively framed information leads to the decay of cooperative behavior of prosocials.

Method

Participants

A total of 79 respondents (19 men and 60 women) ranging in age from 18 to 24 (M = 19.93, SD = 1.16) participated in a between-subject experiment. Participants were Slovak students from the Constantine the Philosopher University in Nitra from various study fields (psychology, social work, urgent healthcare, career counseling) and from all Slovak regions. We used an opportunity sampling method to select participants who were willing to take part in the experiment. Since the main idea of our study was to observe cooperative behavior in social groups, we conducted the experiment with students' seminar groups during classes. Specifically, we carried out the experiment in five groups that slightly differed in the number of students from 15 to 17 members. Participants were classmates and, therefore, knew each other.

Measures

Measuring Social Value Orientation

For measuring an individual's SVO, we adapted a very common method called *the decomposed game*. In previous studies, scholars used various modifications of this method (see Murphy & Ackermann, 2011 or Murphy et al., 2011). This approach is based on making a choice between different allocations of resources for the self and other person. Importantly, in the decomposed game, there is no direct interdependence between the participant and others. Participants are told that they will never meet and interact with the other person and that this person will not receive any feedback about participant's choice (Balliet et al., 2009). This ensures that the choice is based purely on participant's social preferences and is not confounded with any strategic considerations (Murphy et al., 2011).

Despite some critics, such as reducing the richness and dynamics of individuals' social preferences into binary variable or being based on a narrow self-interest postulate (see Murphy et al., 2011), the decomposed games is a very often used method for categorizing individuals into certain SVO types. Individualists and competitors are often combined into a proselfs category, while reciprocators and altruists are combined into category of prosocials. Due to a relatively complex and time-consuming design of our study, we have decided to implement a one-shot decomposed game. Specifically, at the beginning of the experiment, we told participants that two groups were formed that differed in the initial capital they were given. The first group received 20 money units (€) and the second group received no money units. We further explained that participants of the first group were given a task to distribute their initial 20 € capital between them and another anonymous individual from the second experimental group. However, this initial information did not correspond with the actual experimental design of our study. In fact, we gave every participant the task to distribute the initial capital of 20 €, while the second group did not exist. In such a way, we aimed to evoke a situation in which participants had to make a decision whether to act self- or other-interested. We gave participants two options: (a) keep 12 € to themselves and give 8 € to the other participant or (b) keep 8 € to themselves and give 12 € to the other participant. In order to avoid a negative effect of social desirability on their decision-making, we assured participants that their decision was anonymous and that the other random participant from the second experimental group would not be able to trace their identity. Additionally, we highlighted that this initial decision would affect their final outcome as well as the outcome of the random anonymous participant from the fictitious second experimental group. In this way, we wanted to induce that the other person is dependent on the participant's choice. The similar instructions have been used in several previous studies (Brucks & Van Lange, 2007; Van Lange et al., 1997). Depending on whether participants kept 12 € or 8 € for themselves, we classified them as a proself or prosocial, respectively.

Measuring Cooperative Behavior

For measuring cooperative behavior, we used a social dilemma approach. Social dilemmas are defined as "situations in which each decision maker is best off acting in his own self-interest, regardless of what the other persons do" (Van Lange et al., 1992, p. 4). In these situations, individual's own private interests are at odds with collective interests. When a large number of people act selfishly, negative outcomes accumulate, creating a situation in which everybody would have done better if they had decided to act in the collective interest (Dawes & Messick, 2000; Van Lange et al., 1992).

For our study, we adjusted two social dilemmas, namely the *public goods dilemma* and the *commons dilemma* (see Van Lange et al., 2013). In the first *public goods dilemma,* participants received 60 € divided into six parts, each one containing 10 €. Participants had to make six decisions, in six separate rounds, about how much money (from 0 to 10 €) to contribute to a common financial account. We advertised that keeping money for itself was prosperous for the individual but not prosperous for the collective interest of the whole group. We told participants that contributing a high amount of money to common financial account meant that the group would prosper, but persons alone would have done better to save money for themselves. In this way, we wanted to highlight the actual dilemma that is caused by the two conflicting decision-making strategies (keeping for self versus helping group). After six decisions, we told participants that the main purpose of investing in a common financial account was only to raise the financial capital of the group and that the amount of collected money they have contributed was multiplied by the coefficient of 1.4 (as in a standard version of public goods game, see Böhm & Theelen, 2016).

In the second part, a *commons dilemma* task, we instructed participants to decide how much money to withdraw from the multiplied amount in the financial account. In this part, participants had to decide about how much money from 0 to 20 € to withdraw in three rounds. We told them that if every participant in each round decided to withdraw 20 €, such option could lead to resource depletion and the collapse of the financial account. In fact, we let participants decide in all three rounds with no regard about how much money they withdrew. Using this information, we attempted to emphasize that selfish decisions could negatively harm the outcome of the group. Finally, we also highlighted that if there was still some amount of money left in the financial system after all three rounds, the rest of the money would be transferred to other (fictitious) individuals from the second experimental group. In this way, we aimed to assure participants that money left would not be wasted and it would help other persons.

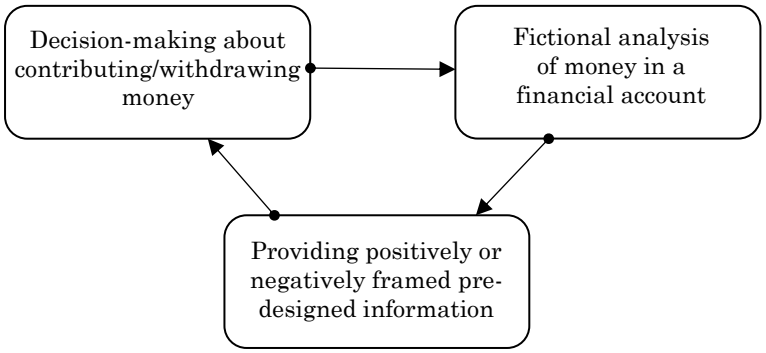
Adapting these two dilemmas in a financial context, we were able to compute two separate measures of cooperation. We calculated them as a sum of money the individual contributed to the financial account in the *public goods dilemma* task (T_Cont) and money they decided not to withdraw from the account in the *commons dilemma* task (T_With). The resulting sums reflected to what extent a person acted cooperatively (i.e., acted in the collective interests as well as in the interests of other fictitious participants). A higher sum of money meant that the participant made more cooperative decisions.

Manipulating Framing Effect

Using nine different rounds of financial decisions in two distinct social dilemmas allowed us to apply an experimental manipulation of the framing effect. After each decision round, we collected information about how much money individuals decided to contribute or withdraw from the financial account. Consequently, the experimenter made a fictional analysis of how much money has been added to or withdrawn from the financial account. We used such manipulation only to portray that the experimenter had truly counted the money in the financial account. In fact, after the fictional analysis, the experimenter provided participants a pre-designed information with no regard to their actual decisions. Importantly, the information was framed either positively or negatively and it was provided after each decision round. The experimental design, therefore, consisted of three main parts provided repeatedly: (a) decision-making, (b) fictional analysis, and (c) providing information (illustrated in Figure 1).

The information was pre-designed in a way that, after each decision-making round, every group of participants was given the exact same information about how much money was in the common financial account. However, we created two sets of information framed both positively and negatively and this was done for both public goods dilemma and commons dilemma. We used a between-subjects study design (i.e., participants were given either positively or negatively framed information).

Figure 1
The Experimental Design



Note. In the experiment, participants made decisions about how much money to contribute/withdraw from the financial account. After deciding, an experimenter made a fictional analysis of decisions and provided pre-designed framed information about the money in the account. This process was repeated nine times (6 rounds for contributing money in a public goods dilemma and 3 times for withdrawing money in a commons dilemma).

In Table 1 we present the set of positively and negatively framed information we used in our study. We used both *valence* and *context framing effect* manipulations (see Gerlach & Jaeger, 2016) to create these two sets of information. In the negatively framed condition, we used the context framing effect manipulation to emphasize the actual loss of a private capital when contributing to the common financial account (e.g., "you have *sacrificed* 79 € from your private capital to the financial account") or to highlight how much money could have been collected (e.g., "the total amount of money in the financial account might have been 150 € right now, but for now only 79 € have been collected"). In the positively framed condition, however, the emphasis was placed in a gain to the financial account (e.g., "the sum in the financial account has *increased* by 79 €") and how much they helped the whole group (e.g., "the average sum you have donated in this round to help the group was 5.27 €"). In some cases, the equivalency framing manipulation was used to frame the information in positive (e.g., "of all 15 participants, 8 individuals were willing to contribute an above average amount of money") and negative way (e.g., "of all 15 participants, 7 individuals were willing to contribute a below average amount of money"). In both social dilemmas, all five information we show in Table 1 was verbally provided by the experimenter after each decision round in the exact same wording, but the nominal values of collected/withdrawn financial resources has slightly differed to evoke that the value in the common financial account is cumulatively increasing/decreasing across decision rounds.

Table 1
The Set of Positively and Negatively Framed Information Used in the Study

Public goods dilemma	
Positive framing	Negative framing
• The sum in the financial account has increased by XX €.	• You have sacrificed XX € from your private capital to the financial account.
• Currently, the total amount of money in the financial account has been increased to XX €.	• The total amount of money in the financial account might have been XX € right now, but for now only XX € have been collected.
• Of all XX participants, XX individuals were willing to contribute an above average amount of money.	• Of all XX participants, XX individuals were willing to contribute a below average amount of money.
• The average sum you have donated in this round to help the group was XX €.	• The average sum you have sacrificed from your private capital was XX €.
• In this round, you might have keep all your money for yourself, but you have decided to help the group by donating XX € to the common financial account.	• In this round, you might have collected a total of XX €, but only XX € was collected.

(continúa)

Commons dilemma	
Positive framing	Negative framing
• You have decided to keep XX € for the other group.	• The sum in the financial account has decreased by XX €.
• The total sum of withdrawn money in the financial account might have been XX € right now, but for now only XX € have been withdrew.	• Currently, the total amount of money in the financial account has been decreased to XX €.
• Of all XX participants, XX individuals withdrew a below average amount of money.	• Of all XX participants, XX individuals withdrew an above average amount of money.
• The average sum you have decided to keep for other group was XX €.	• The average sum you have took for yourself in this round was XX €.
• In this round, you might have withdrew a total of XX €, but only XX € was withdrawn.	• In this round you might have keep all the money in the financial account to help the other group, but you have decided to take XX € for yourself.

Note. The table shows five positively and negatively framed information that were used in the study. The information was provided after each decision-making round, it only differed in the numerical values (marked as XX).

Procedure

The procedure of our study consisted of two main parts. In the first part, participants solved a *decomposed game* that we used to measure participants' SVO. The second part involved nine financial decisions in two social dilemmas—six for *public goods dilemma* and three for *commons dilemma*—. Using the decision-making in two social dilemmas allowed us to examine participants' cooperation. Moreover, repeated decisions allowed us to apply the framing effect experimental manipulation, by providing either positively or negatively framed information about how participants decided.

Data collection took us about 90 minutes in each group. Respondents participated voluntarily and were not provided any compensation for their participation. Our study was carried out in accordance with ethical principles introduced by the American Psychological Association (2016) and we consulted the study design with the ethic committee of the Centre of Social and Psychological Sciences, Slovak Academy of Sciences. Since respondents participated in social groups, we decided to obtain informed consents collectively using an oral form. We briefly informed participants about the goals of the study, the confidentiality and their right to withdraw from the study at any time. At the end of the experiment, participants attended debriefing, in which an experimenter revealed the purpose and the design of the study in detail and discussed the feelings and thoughts participants experienced during the experiment.

Data Analysis

After collecting data, we conducted a post-hoc power analysis to examine the actual power of our study. Using G*Power, the analysis for an ANOVA: Fixed effects, special, main effects, and interactions with four groups, a middle medium effect size of $f = 0.32$ (based on a meta-analysis of Balliet et al., 2009), an alpha of 0.05, and a sample size of 79 revealed that there is 80.2% chance of correctly rejecting the null hypothesis of no difference between groups.

Due to the abnormal distributions of some of the observed variables, we report Kendall rank correlation coefficients (τ). Since our two dependent variables measuring cooperation were moderately correlated (see Table 2), we decided to use a two-way multivariate analysis of variance (MANOVA) with two dichotomous independent factors (framing and SVO), instead of performing multiple two-way analyses of variance (ANOVAs; see Huberty & Morris, 1989; Vallejo & Ato, 2012). The sizes of two experimental groups in our study were unequal and the assumptions of normal distribution of our variables and homogeneity of covariance matrices were violated. Therefore, we have decided to perform a semi-robust two-way MANOVA using the MANOVA_RM package for R version 3.6.2 (R Core Team, 2017), which provides the modified ANOVA-type statistic (MATS) applicable for non-normal distributed data with different sample sizes and heteroscedastic variances (see Friedrich & Pauly, 2018). Additionally, because we had a relatively small sample, we applied a parametric bootstrap approach with 10,000 iterations, which showed to be a better performing method than wild and nonparametric bootstrap procedures (Friedrich & Pauly, 2018). In addition to investigating the overall effect of SVO and framing on cooperation using a two-way MANOVA, we performed multivariate pairwise post-hoc comparisons (Tukey) and we computed simultaneous 95% confidence intervals for contrasts between the groups. This approach offers a deeper understanding of the variability and magnitude of the effects of framing and SVO.

Results

Descriptive Statistics

In Table 2 we provide descriptive statistics and a correlation matrix for two experimental groups. Levene's test of equality of variances and robust independent samples Student *t*-tests showed that the two experimental groups did not significantly differ in age, $F = 3.52$, $p = 0.064$; $t = 0.88$, $p = 0.389$, 95% CI [-0.31; 0.77] or SVO, $F = 1.60$, $p = 0.210$; $t = 0.62$, $p = 0.541$, 95% CI [-0.49; 0.26], suggesting that they were relatively homogenous in the structure of these variables. In the negative framing experimental condition, the SVO showed a weak correlation with the amount of contributed money and a non-significant correlation with the amount of withdrawn money. In the positive framing condition, in turn, these relationships were weak-to-moderate (Table 2).

Table 2
Descriptive Statistics for Two Experimental Groups

Variable	*M*	*SD*	Age	SVO	T_Cont	T_With
Negative framing ($n = 32$)						
Age	20.19	0.26	—			
SVO	1.38	0.09	-0.14	—		
T_Cont	26.97	1.51	-0.31*	0.34*	—	
T_With	31.81	2.19	-0.28*	0.14	0.30*	—
Positive framing ($n = 47$)						
Age	19.79	0.14	—			
SVO	1.45	0.07	0.16	—		
T_Cont	27.32	1.38	0.22	0.61**	—	
T_With	33.62	1.86	0.13	0.39**	0.34**	—

Note. T_Cont = total sum of money an individual contributed in six public goods dilemma decisions, T_With = total sum of money an individual decided not to withdraw in three commons dilemma decisions, * $p < 0.05$, ** $p < 0.01$.

The Moderating Effect of SVO on the Relationship Between Framing Effect and Cooperation

Our aim was to examine the moderating effect of SVO on the relationship between framing and cooperation. The results of the semi-robust two-way MANOVA with 10,000 parametric bootstrap runs showed a non-significant multivariate effect of the framing on the two dependent variables, MATS $Q_N^* = 0.61$, $p = 0.749$. However, there was a statistically significant multivariate effect of the SVO, MATS $Q_N^* = 35.72$, $p < 0.001$, $\eta^2 = 0.32$, indicating that framing effect did not significantly affect cooperation, but that SVO did. Importantly, the interaction between framing and SVO was not significant, MATS $Q_N^* = 4.75$, $p = 0.116$, indicating that SVO did not moderate the effect of framing on cooperation.

Table 3 reports descriptive statistics for the two cooperation measures of the four different groups (proselfs/prosocials in negative/positive framing conditions).

Table 3
Descriptive Statistics for Four Groups

Sample	*n*	M_{T_Cont}	SD_{T_Cont}	M_{T_With}	SD_{T_With}
Proselfs NF	20	24.55	1.59	30.15	3.32
Prosocials NF	12	31.00	2.73	34.58	1.84
Proselfs PF	26	21.92	1.69	28.15	2.67
Prosocials PF	21	34.00	1.15	40.38	1.65

Note. NF = negative framing, PF = positive framing, M_{T_Cont} = average sum of money an individual contributed in six public goods dilemma decisions, M_{T_With} = average sum of money an individual decided not to withdraw in three commons dilemma decisions.

Descriptive statistics showed that prosocials in the positive framing condition were the most cooperative, followed by prosocials in negative framing, proselfs in negative framing, and, finally, proselfs in positive framing.

Table 4 reports the pairwise post-hoc comparisons and simultaneous CIs for contrasts based on the summary effects over two measures of cooperation (i.e., M_{T_Cont} and M_{T_With} in Table 3). These analyses showed that there were two significant differences between the groups. Specifically, prosocials in positive framing condition were more cooperative, compared to proselfs in both the positive and negative framing conditions (see Table 4).

Table 4
Pairwise Comparisons and Simultaneous Confidence Intervals for Contrasts Between Groups

Pairwise comparison	Contrast	*p*	95% CI	
			Lower	Upper
Proselfs NF – Prosocials NF	10.88	0.582	-11.56	33.33
Proselfs NF – Proselfs PF	-4.62	0.941	-26.65	17.40
Proselfs NF – Prosocials PF	19.68	0.041	0.64	38.73
Prosocials NF – Proselfs PF	-15.51	0.210	-36.24	5.22
Prosocials NF – Prosocials PF	8.80	0.563	-8.73	26.33
Proselfs PF – Prosocials PF	24.30	0.001	7.31	41.30

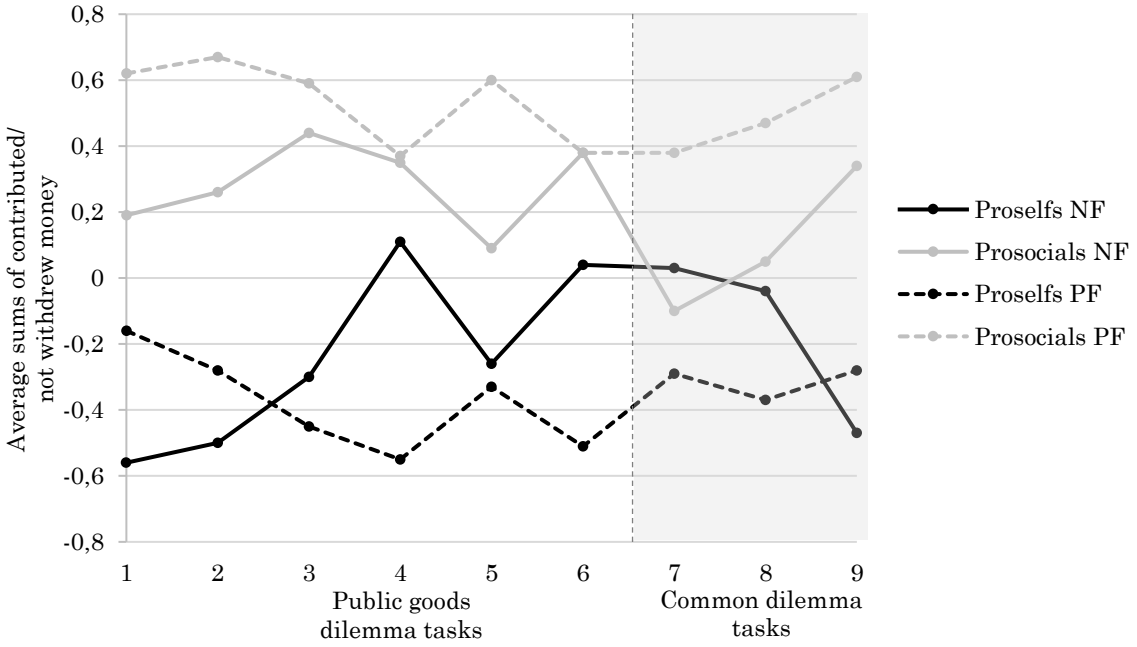
Note. NF = negative framing, PF = positive framing.

Cooperation of Prosocials and Proselfs Over Repeated Decisions

Finally, we hypothesized that the framing effect does not significantly affect the cooperative behavior of proselfs. Their cooperative behavior should be very similar across nine decisions. On the other hand, prosocials should be more sensitive to framing effect. We expected that prosocials in negative framing condition should exhibit a decay in cooperation over the repeated decisions. This should, however, not be present in positive framing condition, because providing positively framed information should foster their cooperation. To see how cooperative behavior of the four groups developed over the nine decisions, we examined the average sums of contributed (six public goods dilemma tasks) and not withdrawn (three commons dilemma tasks) money (Figure 2). As we previously stated, in public goods dilemma tasks, individuals were deciding about investing a maximum of 10€, but in common dilemma tasks, they were deciding about withdrawing a maximum of 20€. Since the two cooperation scores were measured on different scales, we calculated a standardized score to provide a more consistent and reasonable way of showing how cooperation developed over nine decisions.

As Figure 2 illustrates, prosocials clearly acted more cooperatively than proselfs, with more contributions made to the financial system and more money left in the financial system. Surprisingly, prosocials showed a linear increase in cooperative behavior over the three common dilemma tasks, regardless of the framing condition. Together with the results of the pairwise comparisons reported in Table 4, this indicates that SVO may be a more important predictor of cooperation than framing effect.

Figure 2
Cooperation of Four Groups Across Nine Decisions



Discussion

The main aim of our study was to investigate the moderating role of SVO on the effect of framing on cooperative behavior. Using the knowledge from research on reciprocity (Ackermann et al., 2016; Bieleke et al., 2017 Fehr & Gächter, 2000; McClintock & Liebrand, 1988; Parks & Rumble, 2001; Weingart et al., 2007) and the justice theory (Atilgan, 2017; Atilgan & Markovsky, 2021), we focused on cooperative decision-making in repeated social dilemmas. By introducing SVO as an explanatory variable, we sought to explain previous inconclusive findings on the effect of framing on cooperative behavior. We found that framing effect did not significantly affect cooperative behavior in the public goods dilemma or the commons dilemma tasks. Compared to the framing, SVO significantly predicted cooperative behavior in both of these dilemmas, in a way that prosocials acted more cooperatively than proselfs. However, despite the magnitude of the effect of SVO on cooperation, SVO did not moderate the effect of framing on cooperation. Next, we discuss about how these discoveries contribute to current theory as well as the possible implications for future research and practice.

Implications for Theory and Future Research

The Effect of Framing on Cooperation

The previous data on the effect of framing on social cooperation are inconclusive, showing a wide range of effects ranging from strong to non-significant. Our findings are consistent with those studies showing a very limited or no effect of framing on cooperative behavior (e.g., Atilgan, 2017; Bernold et al., 2015; Chowdhury et al., 2017; Cochard et al., 2020; Cox, 2015; Cox & Stoddard, 2015; De Dreu et al., 1992; Dreber et al., 2013; Fleishman, 1988; Gächter et al., 2017; Goerg & Walkowitz, 2010; Grossman & Eckel, 2015; Mann et al., 2020; Meier, 2006; Rutte et al., 1987; Suvoy, 2003). Our results showed a non-significant effect consistently and irrespective of the social dilemma used. Moreover, we did not find any change in effect over a series of repeated decisions, which does not correspond with the findings of Sonnemans et al. (1998). Instead, our results are in line with the assertion of Cubitt et al. (2011) that social cooperative preferences seem to be robust to framing effects.

We see two possible reasons why the framing in our study did not show a significant effect. As Bernold et al. (2015) claim, the effect of framing on social cooperation may depend on the situational context, suggesting that there may be numerous moderators affecting this effect at once. One possibly important factor could be the culture in which the experiment was held, such that the framing effect may not be significant in western individualistic countries but significant in collectivistic societies (Goerg & Walkowitz, 2010). Another important factor could be the unequal gender proportion in our study. As previous studies suggest (e.g., Chowdhury et al., 2017), men and women differ in reactions to information about the cooperative behavior of others. Specifically, men exhibit stronger reactions and change their cooperation more according to framed information about other's cooperative behavior (Maier, 2006). In other words, the negatively framed information may trigger the behavioral assimilation much easily in a sample of men than in a sample of women. Since the majority of participants in our sample were women, who might have not been as sensitive to the information provided, this might cause that we did not find a significant effect of the framing on cooperation.

The Effect of Social Value Orientation on Cooperation

We found that SVO significantly affected cooperation, with a moderate association found between the two. To provide a deeper understanding of how SVO affected cooperation in our study, it is necessary to discuss proselfs and prosocials separately. Regarding proselfs, our findings confirm that they tend to cooperate less than prosocials and that they do not pay attention to the utility of others or situational contextual factors (Beggan et al., 1988; Kelley & Stahelski, 1970; McClintock & Liebrand, 1988). This tendency to act self-interestedly and ignore the utility of other members of the group likely caused cooperative behavior of proselfs to be unaffected by framing. However, our outcomes are inconsistent with those of De Dreu and McCusker (1997), who found that proselfs in a negative framing condition cooperated less than proselfs in a positive framing. This contradiction could be caused by the different research designs employed. Particularly, De Dreu and McCusker's (1997) design involved dyadic interactions. Individuals were instructed to divide a certain amount of hypothetical points between themselves and another participant who was also instructed to do such similar dividing. Although the participants were informed that they would remain unidentified, interacting in small groups in our experiment could better foster the feeling that participants' decisions were indeed confidential and will not be revealed. Thus, they were likely acting in a less socially desirable way. Previous research suggests that anticipated social approval from a partner in social interactions results in increased cooperation in social dilemmas (Ellingsen & Johannesson, 2008; Simpson et al., 2017; Xiao & Houser, 2009). Compared to the study of De Dreu and McCusker (1997), interacting in a social group could promote proselfs' natural free-riding tendencies irrespective of the framing condition.

Compared to the results on the cooperation of proselfs, our findings on prosocials' cooperation seem to be more contradictory than what theory would suggest. As we stated before, the research on reciprocity and the distributive justice theory suggests that the cooperation of prosocials should decrease over repeated decisions when they see that their cooperation is not reciprocally returned. These individuals should adapt over time and change their decision-making strategies from cooperative to individualistic (Fehr & Gächter, 2000; McClintock & Liebrand, 1988; Parks & Rumble, 2001; Weingart et al., 2007). As a result, they should show a decrease in cooperation. However, this was not the case of our study. On the contrary, prosocials kept higher levels during the whole experiment and there seemed to be a slight linear increase of cooperation over the last three decisions. These results do not correspond with the reciprocity research and distributive justice theory. Instead, they are in line with the findings from the first experiment of De Dreu and McCusker (1997), who did not find significant effect of framing on the cooperation of prosocials. Likewise, Bernold et al. (2015) found that prosocials maintained the high level of cooperation over 10 iterated decisions. As Balliet et al. (2009) have argued, SVO should show stronger effects for one-shot social dilemmas because people lack the information or cues that could help them decide whether or not to cooperate. An individual's choice is, therefore, more likely a function of their SVO disposition. However, in iterated social dilemmas, individuals' choices are affected also by others' behavior, pointing to a reciprocity issue. Unexpectedly, Balliet et al. (2009) did not find a difference in the contribution of SVO on social cooperation between one-shot and iterated social dilemmas. Their meta-analytical findings—together with those of De Dreu and McCusker (1997), Bernold et al. (2015), and ours—suggest that the behavioral assimilation of prosocials in reaction to the absence of reciprocity is not a robust phenomenon. Instead, it seems that there could exist some potential mediating or

moderating factors that activate this tendency. Further research is required to find out under what situational and contextual factors prosocials tend to change their cooperation over iterated decisions.

Other Possible Explanatory Variables of the Relationship Between Framing Effect and Cooperation

Perhaps the most important finding of our research is that, despite the significant effect of SVO on cooperation, this characteristic failed to explain the ambiguous effect of framing on cooperation. Our findings, thus, do not support those of Atilgan (2017). Considering that Atilgan's (2017) pilot, vignette, and experimental study either did not bring consistent results on the interaction between framing effect and SVO in repeated social interactions, there still remains the open question for future research as to under what conditions the SVO moderates the effect of framing on cooperation. A possible explanation of our results could be that our moderation model missed some other important exploratory variables.

In fact, there indeed seems to be one particular important factor that could further explain the relations between framing effect, SVO, and cooperation. Although the scope of our study did not include observing the role of emotions in cooperative behavior, we noticed strong emotional reactions after providing negatively framed information during data collecting. After few rounds of decision-making, we observed a wide range of emotional reactions—smiling and laughing at the beginning, head-turning, pounding tables, and loud wrathful verbal reactions in the last decisions (e.g., *What? Really?! That is not possible!*). Interestingly, these emotional reactions did not occur in positive framing conditions. Unfortunately, we did not systematically record these emotional reactions. Therefore, we can only speculate whether smiling and laughing were proselfs' reactions and whether outraged verbal reactions were expressed by prosocials. This would be in line with the studies on the reciprocity theory, suggesting that people experience negative emotions, especially anger, when they interact with individualistically oriented partners who do not act reciprocally (e.g., Bartke et al., 2019; Dickinson & Masclet, 2015; Hu & Mai, 2021; Strang et al., 2016).

The negative emotional reactions to the provided information about cooperation could have affected our results indirectly. Specifically, emotional reactions could mediate the effect of framing on cooperative behavior, while SVO could moderate the effect of framing on individual's emotions. Such model fits with the moderated mediation model theoretically proposed by Schuck and Feinholdt (2015). They suggested that emotions often show a mediating role of the effect of framing on people's opinions, attitudes, behavior, or perceptions. Personal predispositions or contextual factors often moderate the effect of framing on emotions in this process model. With regard to this model, further research is required to investigate whether emotions indeed may affect the relationships between framing, SVO, and cooperation.

Implications for Practice

As Böhm and Theelen (2016) suggested, humanity faces many challenging problems that involve a conflict between a person's own interests and the collective interests, like the pollution, global warming, or overpopulation. Moreover, we also face various conflicting dilemmas in our every-day lives, like separating trash or donating to various institutions that provide public goods. Studying the relationships between framing effect, cooperation, and various individual's predispositions, like SVO, is of particular importance for answering the practical question of how the media can shape human behavior in these areas. The current empirical literature is inconclusive on the effects of media on cooperative behavior. On the one hand, there is a longstanding notion that presenting negative information in media promotes individualistic and antisocial behavior and decreases cooperative behavior (Bushman & Anderson, 2009; Liebert et al., 1982; Paik & Comstock, 1994; Roberts & Bachen, 1981; Rubinstein, 1983). Some studies show that the way how media frame certain governance issues, like managing disastrous events (Berger, 2009) or setting environmental politics (Jönsson & Karlsson, 2016), significantly affects the level of interpersonal cooperation. Especially, using morally loaded language in media might generate framing effect and affect prosocial and cooperative behavior (Capraro & Vanzo, 2019). On the other hand, there is also empirical evidence not supporting this traditional view of the impact of media on cooperation (see Ramos et al., 2016). Our findings are in line with the latter view, suggesting that the way information is framed itself does not affect people's cooperation. However, as we suggested before, further investigation is needed to examine whether the framing could affect individual's emotional states, which subsequently might affect cooperation in social groups.

Study Limitations

Naturally, our study has some limitations. Perhaps the most important limitation is the rather small sample size. Unfortunately, this was a consequence of the fairly restricted and time-consuming design that we used. As a result, with regard to the statistical power of our study, we were able to detect only moderate effect sizes for differences between observed groups. Further research is required to verify our findings on larger samples. Another limitation concerning the sample may be the unequal gender proportion. Since men and women differ in reactions to information about the cooperative behavior of others (Chowdhury et al., 2017), future studies should use more gender-balanced samples.

The second limitation of our study concerns the framing manipulation we used. The design of our experiment did not allow adopting any commonly used framing effect methods, like the Asian disease problem paradigm proposed by Tversky and Kahneman (1981; see Diederich et al., 2018 or Piñon & Gambara, 2005 for variations of this method) or using simple manipulation of labels of the situation (e.g., Ellingsen et al., 2012; Eriksson & Strimling, 2014; Liberman et al., 2004). Although these methods are well documented, they are rather hypothetical and did not suit the design of our study. In result, we had to create our own set of information that was not pre-tested in any study before. A future research could show whether our proposed framing effect manipulation is effective.

Finally, the last limitation of our study is the method for measuring SVO. First, due to a rather complex and time-consuming design, we used only single item method. Although there are some methods based only on one decision (see Knight & Kagan, 1977; Sonnemans et al., 2006), most of them are based on multiple choices (Murphy & Ackermann, 2011). The advantage of using multiple items is that it allows examining the measurement reliability, i.e., to see whether individual's preference is consistent across multiple choices. Unfortunately, we were not able to check the internal consistency. Second, our SVO method did not distinguish between two different types of proself oriented persons—competitives and individualists—. We used such a method because the nature of the experiment, namely, the two social dilemmas used in this study, did not allow any competitive strategy to be used. However, we cannot be sure that the effect of framing on cooperation is similar for competitives and individualists. In general, these two groups should not differ in our two social dilemmas decisions: both should prefer the proself strategy of less cooperation. However, some studies suggest that there are some slight differences in cooperation tendencies of individualists and competitives. Specifically, while individualists cooperate if it brings them a personal gain, competitives never cooperate because they aim to achieve the greatest possible difference in their and others' outcome (Kuhlman & Marshello, 1975; Liebrand, 1984; McClintock & Liebrand, 1988). Considering this, framing should not have any effect on the cooperation of competitives, even in the dilemmas including a threat of the collapse of the resources. In further research, we suggest using more differentiating methods of SVO based on a non-categorical approach, like the SVO Slider Measure proposed by Murphy et al. (2011).

Conclusion

Our research aimed to explain the previous inconsistent results on the relation between framing effect and cooperation by adding SVO as a moderator of this relationship. Our findings showed that framing effect did not significantly affect cooperation in repeated social interactions, but SVO did. Importantly, SVO did not moderate the relationship between framing effect and cooperation. In other words, individuals were not sensitive to the provided information about how the group cooperation occurred. Highlighting prosocial or individualistic behavior did not result in significant change in the cooperation between group members, and remarkably, this applied both for individuals with prosocial and proself SVO. The future research could focus on other possible factors, like the emotional states, which might play a significant role in explaining the relationship between framing effect and cooperation in repeated social interactions.

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