Structure-Trait-Identity Relation (STIR): An Integrative Framework for Understanding Redistribution Decisions in Economic Games

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Abstract

As a social species, making redistribution decisions about how to allocate or reallocate resources across different individuals or groups is crucial for human's survival and well-being at both micro (e.g., disaster relief distribution, charity donation, household income budget) and macro levels (e.g., national budget allocation, public support to wealth redistribution policies) of human society. Dictator games, among other economic games, have been used intensively to study such decisions regarding resource (re)allocation. In a typical dictator game, there are two players: a dictator and a recipient. The dictator decides how to redistribute an endowment, which the recipient cannot reject. Various factors, including dictator personality traits, recipient identity, and endowment transfer actions, have been found to influence dictators' decisions. Several models have been proposed to explain why dictators make certain redistribution decisions in dictator games. While insightful, existing models often oversimplify complex factors, such as task economic structure (e.g., source of endowment, price of transferring endowment between dictators and recipients) and partner identity (e.g, group membership, social closeness), hindering a holistic understanding of redistribution decisions. In this narrative review, we present an integrative framework categorizing factors into four main categories: task structure, dictator trait (trait), recipient identity (identity), and framing. We discuss potential interactions between task economic structure, dictator trait, and recipient identity. We also discuss how framing may influence redistribution decisions through multiple domains. This Structure-Trait-Identity Relation (STIR) framework provides a systematic approach to analyzing decision dynamics and resolving empirical inconsistencies. Future directions are also discussed.

Keywords: Decision Making, Economic Games, Social Context, Personality

1. Introduction

In a world of finite resources, redistribution decisions of how to allocate or reallocate resources across different individuals or groups remains a central challenge for societies worldwide. Redistribution decisions often consider broader economic and societal factors, such as inequality reduction or economic efficiency. While redistribution can be motivated by altruism, its economic and societal considerations distinguish redistribution decisions from pure altruism of which the primary motivation is concerns for others' well-being without necessarily aiming to change overall resource allocation patterns such as reducing inequality or increasing economic efficiency. Redistribution decisions, whether made by individuals, organizations, or governments, have far-reaching consequences at both the micro level (e.g. disaster relief distribution, charity donation, household income budget) and at the macro level (e.g. national budget allocation, public support to wealth redistribution policies), directly or indirectly shaping our communities and our welfare.

How people make redistribution decisions has been studied intensively in the past few decades in the field and in the laboratory. Among research tools, the dictator game has emerged as a powerful experimental paradigm for studying factors associated with people's decisions about redistributing resources. In a typical dictator game, there are two players, a “dictator” and a “recipient”. The dictator solely decides how to redistribute an endowment between themself and the recipient cannot reject the dictator’s decision. The dictator game was first developed by Daniel Kahneman in the 1980s (Kahneman et al., 1986) to test the assumption of pure self-interest in economic behavior. Since then a multitude of various dictator games have been developed to further probe factors associated with economic decision making, such as fairness, generosity, and inequality aversion (Levitt & List, 2007).

Among the various forms of dictator games, one-person single-shot dictator games have emerged as a particularly valuable tool for researchers to understand human distributive behavior and social preferences. In a typical one-person single-shot dictator game, the dictator makes a one-time decision with a single recipient without repeated decisions or interactions. Unlike other economic games such as ultimatum games (Güth et al., 1982) or trust games (Berg et al., 1995), one-person single-shot

dictator games eliminate strategic considerations and reciprocity motives of the dictating individual, providing a relatively clean measure of innate, non-strategic concerns such fairness preference and altruism (Levitt & List, 2007). By observing how individuals allocate resources when they have complete control and face no consequences for their decisions, researchers can isolate intrinsic motivations for sharing. This simplicity makes one-person single-shot dictator games an essential tool for investigating the foundations of preferences in resource distribution and its impacting factors, such as personality traits and task contexts. Furthermore, unlike other versions of dictator games such as multi-round dictator games, one-person single-shot dictator games prevent learning-related effects (e.g., Brosig-Koch et al., 2017) or reputation building (e.g., Kim & Kim, 2019), offering insights into people's innate and core motivations behind redistributive decisions. As such, one-person single-shot dictator games serve as a fundamental building block for understanding more complex economic interactions and social dynamics.

Dictator games have played a pivotal role in challenging the traditional economic assumption of pure self-interest, consistently demonstrating that individuals often choose to share resources with others even when there is no strategic incentive or possibility of reciprocation. Over the years multiple models have also been proposed to explain findings from the dictator games (for a recent review, see Nicklisch & Paetzel, 2020). Although existing theoretical models have provided valuable insights, most models typically only capture one specific factor despite evidence showing that decision making in dictator games is multifaceted. For example, the seminal and influential Fehr-Schmidt model (Fig.1A) only includes inequality aversion in the model, while previous research has found that social context such as whether a recipient is a stranger or a charity organization can also influence a dictator’s decisions (Umer et al., 2022). No model so far has been able to coherently accommodate the nuances of redistribution decision making, such as different wordings of the same logically unchanged game can affect a dictator’s decision (i.e., framing effects, for a review see Gerlach & Jaeger, 2016), which can make experiment design and result interpretation difficult (see Section 5 for more details and discussion). Therefore, there remains both a theoretical and a practical need for a more comprehensive and integrative framework. In this narrative

review, by synthesizing the wealth of empirical findings from dictator game experiments from the perspective of task structure, dictator traits, and recipient identity, we propose a novel integrative Structure-Trait-Identity Relation Framework (STIR) that unifies and extends current theoretical approaches.

In the subsequent sections of this review paper, we explore and analyze major factors associated with redistribution decisions in single-shot (i.e. a dictator play with a certain recipient only once so there is no opportunity or need for strategic decision making), one-person (i.e. in each game there is only one dictator transferring endowment to one recipient) dictator games based on the framework we propose in this paper. First, in Section 2, we present the proposed framework and discuss its differences from previous models. Then we discuss intra-individual decision variability in terms of trait activation (Section 3) and explore dictator trait-task social context interactions (Section 4). Next, we review framing effects and discuss potential

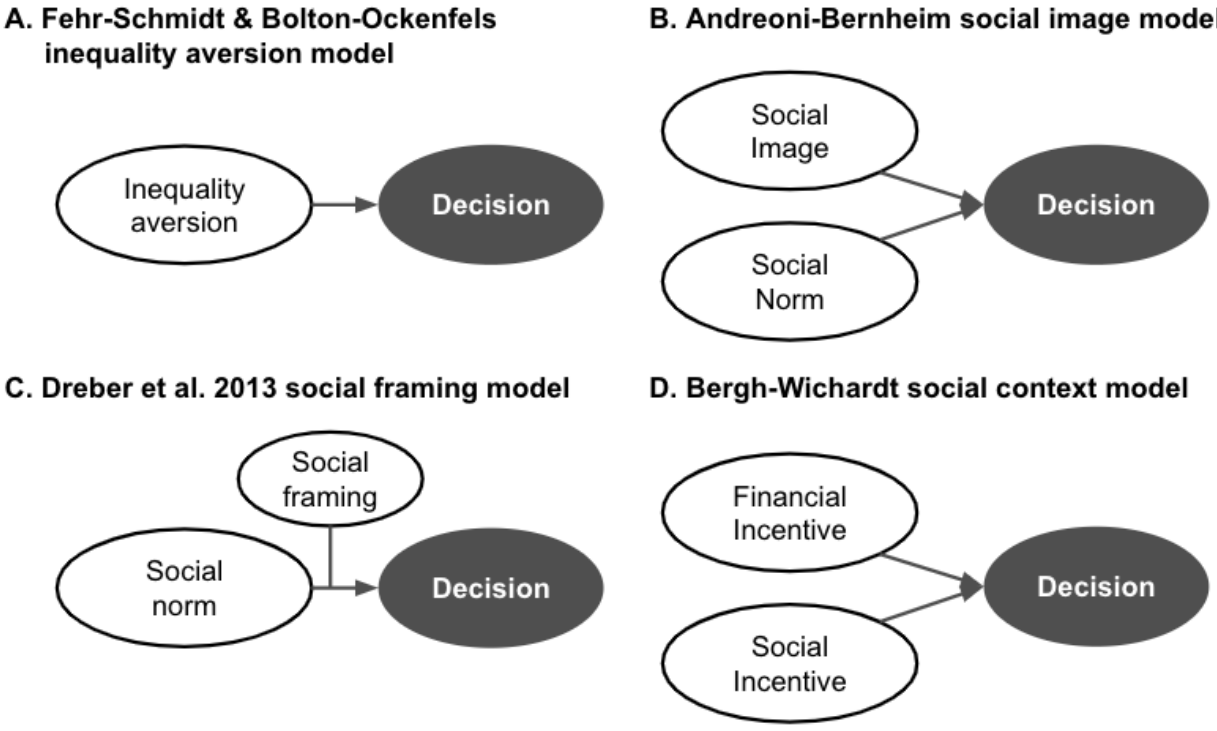

Figure 1. Conceptual diagrams of (A) Fehr-Schmidt model (Fehr & Schmidt, 1999) and Bolton-Ockenfels model (Bolton & Ockenfels, 2000), (B) Andreoni-Bernheim social image model (Andreoni & Bernheim, 2009), (C) Social framing model (Dreber et al., 2013), and (D) Bergh-Wichardt model (Bergh & Wichardt, 2018).

mechanisms based in light of the framework (Section 5). In the final sections (Section 6 and 7), we will explore the potential applications and future directions of the STIR framework and conclude, demonstrating the framework's versatility in addressing various research questions and its capacity to bridge findings across different economic games and decision-making contexts.

2. An Integrative Framework of Redistribution Decision Making in Dictator Games

Although multiple models of redistribution decision making have been developed based on factors found from various single-shot-one-person dictator games, an integrative framework that articulates various factors and unifies existing models is lacking. Here, we synthesize prior literature to support an Structure-Trait-Identity Relation Framework (STIR) that provides an integrative and unified structure for decision-making factors, encompasses interactions between them, and provides both structure and potential explanations to various framing effects. Below we first briefly overview previous theoretical work. Then we present our STIR framework (Fig.2) and compare it with previous models. We will illustrate how our framework may help (re)explain earlier findings, including inconsistencies among findings, in Section 3 to Section 5.

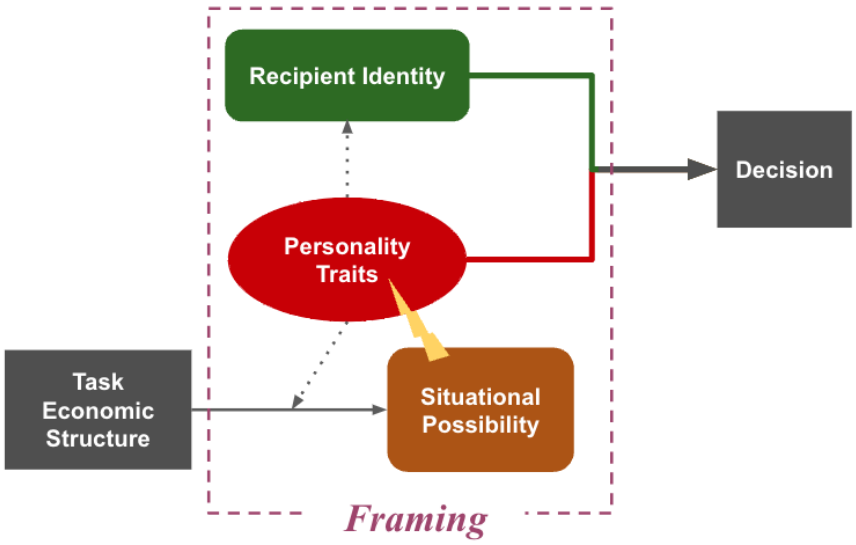

Figure 2. The STIR (Structure-Trait-Identity Relation) Framework

Several models of decision motives in single-shot-one-person dictator games have been proposed (Fig.1). A prominent and perhaps the most influential one among existing models is the Fehr-Schmidt model (Fehr & Schmidt, 1999). The model captures inequality aversion (including both aversion to advantageous inequality and aversion to disadvantageous inequality) as non-economic parameters (Fig.1A). The final redistribution decision depends on the sum of effects from both aversions. Bolton-Ockenfels model (Bolton & Ockenfels, 2000) is another prominent model alongside the Fehr-Schmidt model that also captures inequality aversion in their model (Fig.1B). Compared to Fehr-Schmidt model using dictator-recipient pairwise comparison of inequality, Bolton-Ockenfels model uses relative standing compared to the group average. Instead of modeling inequality aversion, later theoretical works such as Andreoni-Bernheim social image model (Andreoni & Bernheim, 2009) and social framing model (Dreber et al., 2013) added a more social perspective to capture redistribution decision making in dictator games. According to the Andreoni-Bernheim social image model, dictators' decision depends on both how much they care about the social norm (e.g. equal split of a windfall endowment between themselves and recipients) and their belief about their own social image based on the redistribution decision they might make (Fig.1C). Building off the Andreoni-Bernheim social image model, Dreber et al.'s social framing model (Dreber et al., 2013) further included a social framing factor that denotes the congruence between a specific framing of social context and social norm (Fig.1D). More recent theoretical works such as the Bergh-Wichardt social context model (Bergh & Wichardt, 2018) and the Tusche-Bas computational framework (Tusche & Bas, 2021) took a cross-domain approach and juxtaposed financial and non-financial factors (Bergh-Wichardrt) and a multitude of factors from behavioral economics, psychology, neuroscience economics (Tusche-Bas) in their models.

In contrast to the atomic and isolated manner in approaching factors or phenomena associated with decision making in dictator games in previous models, we propose a framework that adopts an integrative and systematic approach, the Structure-Trait-Identity Relation framework (STIR). In the STIR framework, we propose that the ultimate redistribution decisions are determined by the interaction between three

domains of factors: task structure, dictator traits, and recipient characteristics. Amongst these three domains, task structure and dictator traits serve as primary motives that determine how a dictator decides to redistribute the initial endowment. Recipient characteristics moderate the associations between task structure, dictator traits, and redistribution decisions. Besides factors from the three domains of task structure, dictator traits, and recipient characteristics, how a dictator game is presented has also been shown to significantly impact redistribution decisions when the game itself remains logically unchanged, a phenomenon known as the “framing effect”. Therefore, we further suggest that a particular framing can selectively upweight certain factors from one or several factor domains, rendering the upweighted factors a disproportionately salient and strong influence on the dictator's decision making. The upweighted factors’ influence can be enhanced by the framing to the extent that they outweigh other potentially relevant factors from the same domain.

The STIR framework is different from previous models in at least three major ways. First, in contrast to the previous model’s single-factor based atomic and isolated approach, our framework provides an overarching structure to factors that have been implicated to link to decision making in dictator games by categorizing them in three distinct domains (task structure, dictator traits, recipient identity). Such overarching structure paves the way for a comprehensive and holistic understanding of redistribution decision making in dictator games, which none of the previous models can achieve. Second, our framework makes room for important but currently understudied interactions between factors from different domains (more detailed discussion in Section 4). Among previous models, interaction between factors is narrowly possible at best in the Bergh-Wichardt model by allowing social framing and social norm to interact. Furthermore, our framework provides both structure, mechanism-level explanations, and testable predictions to framing effects. These characteristics can assist in unraveling the elusive and challenging framing effects in dictator games, which have perplexed and troubled researchers in the field for decades despite the existence of multiple models (more on this in Section 5). Lastly, our framework can help (re)interpret previous findings, such as intra-individual variability in redistribution decisions (see Section 3) . Overall, we suggest that, in single-shot-one-person dictator games, the

interaction between salient factors from distinct domains of task structure (structure), dictator traits (trait), and recipient identity (identity) shape the ultimate redistribution decision.

3. Explaining Intra-individual Variability across Different Games: Situational Possibility Detection and Personality Trait Activation

Personality traits, which refers to an individual's relatively stable patterns of emotion, motivation, cognition, and behavior in response to environmental stimuli (Roberts, 2009), have been shown to be associated with sharing behavior in the Dictator Games. For example, researchers found that dictators who showed stronger traits of Big Five Agreeableness and HEXACO Honesty-Humility, two broad personality traits concerned with promoting interpersonal harmony and cooperation, redistributed more money to their recipients (Zhao et al., 2017). In the same study the researchers also revealed that for Big Five Agreeableness, it was stronger trait politeness but not trait compassion, two aspects of Agreeableness, that was uniquely associated with allocating more money to recipients. In a later study, another group of researchers also further demonstrated that the link between HEXACO Honesty-Humility (HH) can be attributed to HH trait itself rather than only to aspects of the HH trait that explicitly refer to money and/or wealth (Thielmann & Hilbig, 2018). (For a comprehensive meta-analytic review of personality traits and prosocial behaviors in the dictator games, see Thielmann, Spadaro & Balliet, et al., 2020).

However, the expression of some specific personality traits, as reflected by redistribution decisions in economic games, seems to be sensitive to the type of economic games (Chapman et al., 2023), indicating intra-individual variability in the associations between personality traits and decisions across different economic games. Such intra-individual variability has also been observed within variations of dictator games. For example, earlier studies found that, when the initial endowment is divided between the dictator and the recipient and the dictator is allowed to take money from the recipient, the generosity of dictators can be reversed compared to when they can only give money to recipients. That is, previous "giver" dictators who transferred money to the recipient no longer transfer money to a recipient or even take money from the

recipient (Bardsley, 2008; Korenok et al., 2014; List, 2007). In contrast, a more recent meta-analysis examining the "taking games" shows dictators take less if recipients' endowment is earned rather than a windfall (Umer et al., 2022). Such sharing decision sensitivity to endowment transfer option set, endowment source and other task structure features such as payoff structure (i.e. the price of a transfer action, Andreoni & Miller, 2002) (Fig. 3) cannot be coherently explained by existing models. Fehr-Schmidt and Bolton-Ockenfels model can only account for the effects of inequality aversion, and Andreoni-Bernheim can only account for social image concerns and social norms. Neither Dreber et al.'s social framing model nor Bergh-Wichardt model that built off previous models by including social framing and social context can explain economic structure's influence on a dictator's decision. This gap underscores the importance of examining how task economic structure affects redistribution decisions in dictator games. The economic structure of dictator games (and other economic games) may relate closely to principles of distributive justice (Deutsch, 1975), reflecting the fundamental underlying values (e.g., equity, need, ability, effort, accomplishment, favoritism, the worst-off, etc.) people consider when distributing limited resources. By systematically investigating these relationships, we can gain crucial insights into how institutional frameworks and decision-making contexts influence resource redistribution behaviors, potentially informing the development of more effective and equitable redistribution policies in real-world scenarios.

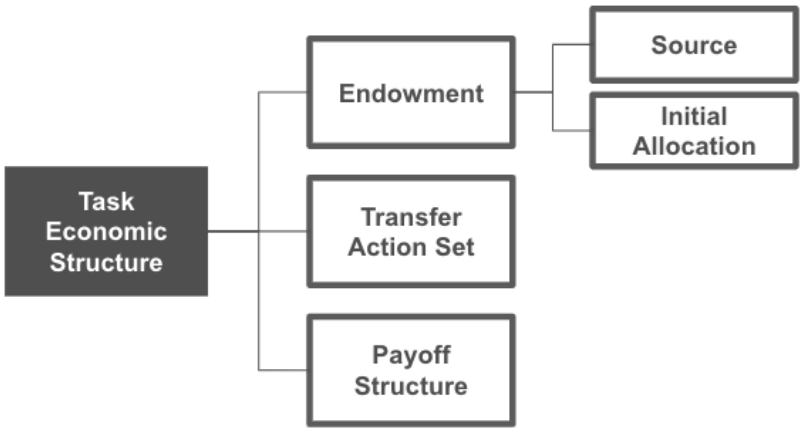

Figure 3. Components of Task Economic Structure - the source of endowment (Source), how initial endowment is allocated between a dictator and participant (Initial Allocation), transfer action set (e.g. a dictator can only transfer initial endowment by giving to recipient, taking from recipient, or both), and payoff structure (i.e. the price of a transfer action).

One possible explanation to intraindividual variability in effects of personality traits on decisions in variations of dictator games is the activation of certain personality traits in a game. The activation of certain personality traits might *interplay* with *situational possibilities* provided by a task's economic structure. Here, we build off Thielmann et al. 2020's "Affordance Framework" (Fig. 4). According to Thielmann et al. 2020's "Affordance Framework", the expression of personality traits is governed by overarching situational affordances (possibility) (i.e. exploitation, reciprocity, temporal conflict, and uncertainty-dependent dependence) and the subaffordances (sub-possibilities underneath an overarching possibility, Fig.4) of a specific situation (e.g. the sub-possibility to harm others when the overarching possibility of exploitation is

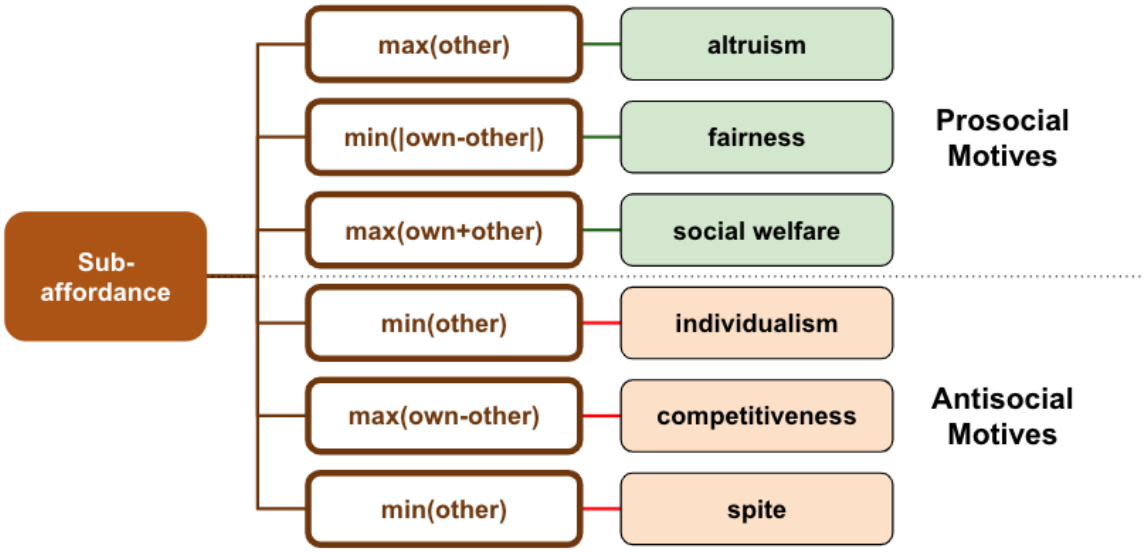

Figure 4. Subaffordances (situational possibility) and corresponding social motives (adapted from Table 4 in Theilman et al., 2020) - to maximizing others' outcome (max(other)), minimize the (absolute) difference between own and others' outcomes(min(|own-other|), maximize the sum of own and others' outcomes (max(own+other)), maximize one's own outcome (min(other)), maximize the difference between own and others' outcomes (max(own-other)), and minimize others' outcomes ((min(other)).

possible, as in dictator games where taking from a recipient is possible). The (sub)affordances of a situation collectively determine the manifestation of certain traits. The Affordance Framework of possibility activating personality traits may help explain an earlier example in which the availability of taking from recipient made previous

“giver” dictators into “zero-transferer” or even “takers” (Bardsley, 2008; Korenok et al., 2014; List, 2007). It could be that the option of taking from recipients made the subaffordance/possibility of maximizing the dictator’s own outcome more explicit and salient, which in turn activated antisocial traits such as individualism or greed (Fig.4).

While the Affordance Framework posits that situational affordances govern the expression of personality traits, we argue that this relationship is more complex and dynamic. The detection and interpretation of situational affordances allowed by a games economic structure may, in fact, be contingent upon certain personality traits from the outset. For instance, individuals high in trait prosocial tendencies might be more attuned to cues in the task structure that suggest opportunities for generous behavior. Once detected, these affordances can further modulate the salience of the initial detecting traits and activate or suppress other situation-sensitive personality traits. For example, although people overall were less generous when dictators could take money from their partners (List, 2007), there were individual differences and about a third of the participants chose to give to the recipient nonetheless despite the possibility of giving zero or even taking from the recipient. Those people who still chose to give might have stronger prosocial traits which make them less likely to perceive or act upon the possibility of *taking* money from a partner, while those with more pronounced self-interest traits might be more likely to detect and utilize the opportunity to take. Such individual difference and persistent giving despite the possibility to take suggests the relationship between task economic structure based situational affordance and personality trait activation is not deterministic but rather a more nuanced and dynamic process. Personality traits have been implicated to be associated with both situations and the perception of a situation (e.g., Nasello et al., 2024; Rauthmann et al., 2015). Taken together, these observations show that empirical work is needed to examine the dynamics between personality traits, the task structure of an economic game, and the perception of situational possibilities.

Our perspective on the dynamic interplay between personality traits and task structure related situational affordance offers several valuable implications for future studies in the field of behavioral economics and decision-making in general. By recognizing the intricate relationship between affordances and personality trait

activation, researchers can design more nuanced experiments that account for this complex interaction and better explain both intra- and inter-individual variability in decision making across variations of dictator games. Furthermore, our perspective highlights the importance of considering both trait-level and situation-level personality factors in experimental designs, potentially leading to more accurate predictions of behavior in various economic contexts.

4. Integrating the Factor of Recipient Identity

Besides intraindividual variability in dictator games of different economic structure, previous research also has found the same dictator may make different redistribution decisions depending on certain aspects of a recipient's identity. Dictators give more money to recipients whose family names are revealed to the dictators compared to nameless recipients (Charness & Gneezy, 2008). Dictators also give more to own-nationality recipients than to foreigners (Kumar et al., 2021). Sensitivity to recipient identity has been observed among children dictators as well: children of age five and above share more stickers with their friends compared to strangers. Additionally, there is evidence that recipient identity interacts with other factors. For example, a recent meta-analysis examining 80 dictator game studies spanning 23 years looked at the influence of endowment source (earned versus unearned) and recipient identity (a student stranger versus a charity organization) on donations (Umer et al., 2022). The researchers found a significant interaction between recipient identity and endowment source: dictators donate more to charity recipients than to student recipients when the endowment is unearned compared to when the endowment is a windfall (Fig.6). It was conjectured that the windfall endowment led to disproportionately high generosity compared to earned endowment. Other researchers from the field have also speculated interactions between perceived situations and personality traits (e.g., Engel, 2011). However, despite theoretical postulations and concrete evidence, an integrative theory that unifies how different types of recipient identity interact with personality traits is still lacking. Therefore, here we propose a potential common mechanism that underlies the effects of recipient identities - social distance based exclusion from a dictator's psychological scope.

One goal of our framework is to integrate different factors associated with redistribution decisions in dictator games and provide a “roadmap” that allows systematic examination of the dynamics between factors. We propose that recipient identity affects dictators’ sharing decisions by affecting dictator’s perception of recipient-dictator social distance. “Social distance” is defined as “the degree of sympathetic understanding that functions between person and person, between person and group, and between groups” (Bogardus 1959, p. 7, as cited in Mather et al., 2017). Factors related to social distance such as ingroup-outgroup membership, interpersonal similarity (Mentovich et al., 2016), and dehumanization (Harris & Fiske, 2006) have been found to be associated with how prosocial people can be toward others. For example, research on dehumanization shows that perceiving other people as different and less human is associated with decreased social relatedness and increased social distance, result in increased in antisocial behaviors and utilitarian judgment and decrease in prosocial behaviors and deontological judgment (for a review, see Haslam & Loughnan, 2014). These findings suggest recipients’ identity may change a dictator's perception of social distance from the recipient, which in turn moderate how much the recipient would be included to (excluded from) the psychological scope of the dictator's active prosociality and antisocial traits, such as altruism, concern for other, and inequality aversion, competitiveness, envy, and Machiavellianism (Thielmann et al., 2020).

Similar to the nuanced interplay between personality traits and situational affordance allowed by the economic structure of a dictator game, the perception of a recipient’s characteristics can also be contingent upon certain personality traits of the dictator from the outset, resulting in both within- and between-individual differences in the influence of recipient identity on a dictator’s decision. Previous research has shown that people who are high in certain traits (e.g., narcissism and more aggression, Locke, 2009); interpersonal disgust, Hodson & Costello, 2007) are more likely to dehumanize others. If assigned the role of a dictator in the dictator games, these people may be more sensitive and faster in detecting interpersonal differences between themselves and their recipients, which may further increase the perceived social distance between them and results in exclusion of the recipients from the scope of the dictator’s prosociality, such as aversion to exploitation and advantageous inequality. Future

studies could leverage advanced cognitive assessment tools such as computational modeling such as Drift Diffusion Model (DDM, Ratcliff, 1978; Ratcliff et al., 2016) to disentangle the complex mental processes involved in dictator decision making when recipient identity is manipulated. For example, in the framework of DDM, a recipient that is perceived as more socially distant from the dictator may increase the decision boundary for giving money to the recipient or bias the starting point of evidence accumulation toward withholding or taking money from the recipient, making it less likely for a dictator to give money to the recipient.

5. Framing: Moderator of Structure, Trait, and Identity Effects on Decisions

Researchers using economic games have long noticed that altering the wording of descriptions, while keeping the underlying game unchanged, influences people's behavior, which is known as the “framing effect”. In economic games, framing refers to “the provision of differently worded but logically equivalent descriptions of otherwise unchanged games” (Gerlach & Jaeger, 2016). Framing effects have made it both difficult to study decision making using economics games and to interpret the results. The phenomenon has been well-studied empirically and multiple classes of theories have been employed to coherently explain their elusive yet consequential effects without success (for a general review of the economic games literature, see Gerlach & Jaeger, 2016; for a dictator game-focused review, see the introduction in Capraro & Vanzo, 2019). Based on our STIR framework, we propose that framings make their way into decisions by triggering (deactivating) or enhancing (suppressing) factors that link to dictator traits, perception of situational possibilities, and perception and recipient identity. The ultimate effect is the sum of all factors enhanced (suppressed) by the framing.

Before discussing previous findings in framing effects using the STIR framework, it is important to distinguish “differently worded and logically changed games” from “differently worded but logically unchanged games”, because it is only possible to study how “different words” affect decision making when the game itself is not changed to a effectively different game. For example, in Dreber et al., 2013, the researchers aimed to

study the effect of the social framing of giving to vs taking from recipients. Based on the insignificant difference in dictators' money transfer, they claimed that "behavior is insensitive to social framing". However, according to how they set up the game, the manipulation of giving to vs taking from recipients are not only different at wording level, but also different at the level of game logic. In the giving-to-recipient condition, the initial endowment was $10 to the dictators and $0 to recipients. However, the taking-from-recipient condition, the initial endowment was $0 to dictators and $10 to recipients, entirely reversed compared to giving-to-recipint condition. This *framing* manipulation went beyond wording and effectively created two different games with different transfer action availability, i.e. dictators could only give in giving-to-recipient condition while they could only take in taking-from-recipient condition. The difference in transfer action availability covaried with the wording that was only aimed to change the presentation of the game but not the logic of the game. With wording effects confounded by changes in transfer action availability, it is impossible to attribute any (null) result to the (absence of) effect of framing. Therefore, it is very important to make sure that the games across framing conditions are truly "differently worded but logically unchanged".

For studies trying to explore framing effects that indeed only manipulated the wording of a game without logically changing the game, our structure-trait-identity framework may help shed light on *how* a specific framing influences decision making. For example, in an earlier study (Brañas-Garza, 2007), the researcher found that adding a sentence of "Note that your recipient relies on you" significantly increased the dictator's sharing behavior. Corresponding to the logic in the previous example, the extra sentence may have brought forth the subaffordance of *max(other)* (i.e. the possibility to maximize other's outcome) compared to control condition (no extra sentence) and activated pro-social traits, such as altruism. In another later study (Capraro & Vanzo, 2019), researchers manipulated the words describing available transfer actions (the dictator could either decide to keep everything for themselves or give everything to the recipient) using six terms that covered a wide range of connotation valence, from very negative (e.g., stealing) to very positive (e.g., donating). They found that "stealing" framing, not "donating" or "boosting", led to the highest rate of dictator's choosing to give the entire endowment to the recipient. Based on the

framework, one possible explanation to the effect of “stealing” frame could be that the “stealing” frame brought forth the subaffordance of *min(other)* (i.e. the sub-possibility of harming other people underneath the overarching possibility of exploitation), and activated related traits in dictators such as “do no harm” (Li et al., 2022) (Fig.8). With this trait activated, the dictators chose to do “no harm” by not “stealing” and choose the only non-stealing option of giving all endowment to the recipient. The possible explanation to “donating” and “boosting” not eliciting as much giving in a dictator could be that these two frames were not strong enough to bring forth the subaffordance of *max(other)* to sufficiently activate the *max(other)*' related traits such as altruism. They also could not bring forth the subaffordance *min(other)* due to semantics to activate “do no harm” traits as “stealing” framing might have. Therefore, the dictators in “donating” and “boosting” did not evoke as high a rate of choosing to give as “stealing” did. This explanation is likely given what was found in Study 2 in Capraro & Vanzo, 2019. In Study 2 they asked brand new participants to rate each of the framing words from Study 1 from “extremely wrong” to “extremely right”, and they found moral judgment could explain the framing effect.

Building off the framework, besides affecting dictator traits, framing can also influence decision making by affecting social context (Fig.2). Using Brañas-Garza, 2007 again as an example. Instead of increasing sharing by activating or enhancing prosocial traits such as altruism as discussed above, the framing “Note that our recipient relies on you” might have reduced the perceived social distance between the dictator and the recipient, therefore effectively changing the social context. Or the framing could have influenced the dictator’s decision by affecting both personality activation and social context . Such alternative explanations to framing effects are testable by measuring social distance related differences such as the Inclusion of Other in Self (Aron et al., 1992) and by measuring differences in associations between certain personality traits between framing conditions. Future studies examining framing effects in dictator games could take an integrative approach using our framework. Such an approach could help identify and predict how framing ultimately influences redistribution decisions via highlighting certain situational affordance provided by the task’s economic structure and recipient characteristics.

6. Open Questions and Future Directions

In this narrative review, we comprehensively synthesized a wealth of research on single-shot one-person dictator games, offering a novel perspective on how task structure, dictator traits, and recipient characteristics collectively shape redistribution decisions. We proposed the STIR (Structure-Trait-Identity Relation) Framework, which provides a unified approach to understanding the complex interplay between these factors. Using the STIR framework, we addressed several limitations in existing models that fail to fully account for the variability observed in dictator game outcomes. More importantly, we showed how the STIR framework can help explain intra-individual differences across variants of dictator games and framing effects. We also suggested several testable hypotheses based on the framework for future work. By integrating diverse findings from behavioral economics, psychology, and social sciences, our STIR framework offers a more nuanced and holistic explanation for decision making in different resource redistribution scenarios.

Building upon our integrative STIR framework, there are several promising avenues for future research that will not only test and refine our model but also extend its applicability to broader contexts of economic decision-making and social behavior. Although our framework is derived from dictator games, it captures components that are universal across economic games (task structure, decision maker, partner). Such a structure allows our framework to be extended beyond its original foundation, making it applicable to a wider range of economic tasks and contexts. For example, one important area for future development is extending our STIR framework beyond single-shot one-person dictator games to other variations of dictator games, such N-person games (e.g., multiple dictators or multiple recipients; e.g., Alós-Ferrer et al., 2022; Schank, 2021), multi-round dictator games (e.g., Brosig-Koch et al., 2017), or games in which the role of a participant is uncertain (e.g., Ben-Ner et al., 2004). This can be achieved by adding factors such as altered responsibility, habituation, interdependence as potential moderators of the key components in the original STIR framework.

Leveraging the STIR framework's flexibility, another promising future direction is to extend its application from dictator games to other economic games. For example,

the framework can be readily applied to the ultimatum games. The key difference between a dictator game and an ultimatum game is that the recipient in the ultimatum game can reject an offer from the proposer (a.k.a. the dictator in the dictator game) and break the deal (i.e., neither party in the game gets any money) as a punishment for unfairness. This simple difference of recipient being able to reject an offer can result in significant difference in the proposer's decisions and increase the size of their offers (e.g., Sazhin et al., 2024; see Fig. 5). The STIR framework can be applied to the ultimatum games by adding a power component. Researchers can investigate the role of power in redistribution decisions by examining how power changes effects of task structure, decider trait, and partner identity on decisions between corresponding dictator games and ultimatum games. In a similar fashion, other factors that are the popular or emerging targets of research using economic games can also be added to the STIR framework as potential moderators of its basic components, such as reciprocation, punishment, emotion regulation (Grecucci & Sanfey, 2014; Heilman et al., 2016), and cognitive and affective state of decision makers (e.g., Schulz et al., 2014; Castagnetti et al., 2023; Tan & Forgas, 2010; cf. Ibanez et al., 2017; Tinghög et al., 2016). Various expansions of the STIR framework can be achieved and tested to see how task context and individual trait and state may interact with task structure, participant trait, and partner characteristics in their influence on decisions. Such expansions of the STIR framework to tasks beyond dictator games can help bridge findings across economic games, offering a more comprehensive model of human behavior in various economic, social, and psychological scenarios.

While expanding our framework to diverse economic games offers valuable insights into decision making across various contexts, another crucial dimension to explore is how the effects of the key decision-making components in our framework evolve throughout the lifespan. Exploring the role of age within our framework can offer valuable insights into how decision-making processes evolve as people age, with particular relevance to understanding financial exploitation vulnerability in older adults. For example, they might investigate whether older adults are more sensitive to framing effects or social cues in the task structure and partner identity, contributing to age-related differences in sensitivity to social context (e.g., Fareri et al., 2022) or susceptibility to financial exploitation (e.g., Yang et al., 2023). Additionally, examining how age-related changes in different personality traits (e.g., Bleidorn et al., 2022), including emotion regulation (e.g., Roberts et al., 2006), interact with perception of situational affordance provided by task structure and perception of partner

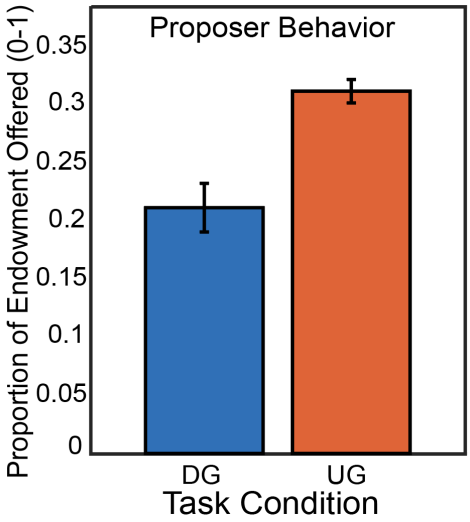

Figure 5. Participants offered less in the Dictator Game (DG) compared to in the Ultimatum Game (UG). The only difference between the two tasks is recipients being able to reject an offer. This figure was reproduced with permission from Sazhin et al., 2024.

characteristics could provide a mechanistic understanding of factors related to risk for financial exploitations.

As we consider the impact of task-specific and individual factors like power dynamics between players and decision maker's age on economic decision-making, it is

equally important to broaden our perspective and incorporate environmental factors into our framework, such as neighborhood-level socioeconomics, built environment, and social cohesion. These contextual elements are associated with and can profoundly affect people's cognitive and psychosocial functioning (e.g., Cagney et al., 2009; Elo et al., 2009; Mennis et al., 2022), which may in turn influence how people perceive the possibilities embedded in decisions related to resource allocation and people's perception of others (e.g., Haslam, 2022), two key components of our framework (i.e., situational possibility provided by task economic structure and partner identity). Previous research has suggested that community-level factors may interact with certain personality traits and expose certain populations to higher risk for financial exploitation (Tropea et al., 2024). By incorporating environmental factors into our framework, researchers can have a more comprehensive and nuanced view of how factors at task, individual and community levels interactively affect economic behaviors, including maladaptive ones that may increase people's vulnerability to financial exploitation.

7. Conclusions

Our narrative review has presented a comprehensive framework, STIR (Structure-Trait-Identity Relation) for understanding redistribution decisions building off previous findings in single-shot one-person dictator games. Our STIR framework integrates task economic structure, dictator traits, and recipient identity, three key components in dictator games and economic games in general. The framework offers a nuanced explanation for the variability in dictator game outcomes. It also provides a flexible foundational scaffolding that can be expanded to other economic games and help explain past findings and guide future studies, such as strategic decision making in various economic and social contexts, age-related effects, and environmental influences. As we continue to unravel the intricacies of human decision making, the integrative approach offered by the STIR framework promises to make significant contributions to behavioral economics, psychology, and related fields, with the potential to inform policies and interventions that positively impact individuals and communities.

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