

# Strategic thinking and behavior during a pandemic

Nir Halevy\*

## Abstract

This paper introduces a novel theoretical model and measure of strategic thinking in social decision making. The model distinguishes four strategic orientations: *egocentric* (thinking about how one's actions shape one's outcomes), *impact* (thinking about how one's actions shapes others' outcomes), *dependency* (thinking about how others' actions shape one's outcomes), and *altercentric* (thinking about how others' actions shape their outcomes). Applying this model to explain social behavior in the context of the COVID-19 pandemic, an exploratory study finds that the more people think about how their actions shape others' outcomes, the more likely they are to: (a) comply with social distancing restrictions designed to curb the spread of the virus, and (b) donate money they received in the study to charitable organizations. These findings advance understanding of the multifaceted nature of strategic thinking and highlight the usefulness of the Strategic Thinking Scale for explaining social behavior.

Keywords: COVID-19 pandemic, social distancing, prosocial behavior, interdependence, decision-making

## 1 Introduction

The worldwide COVID-19 pandemic has rattled the lives of many millions of people in 2020. Its impact has been felt in every aspect of individuals' lives. In addition to the human lives lost and the harm caused to individuals' physical health and mental well-being, the lockdowns, closures, and quarantines introduced in many countries have resulted in a marked economic downturn and a sharp spike in unemployment in many locations. The pandemic has also constrained individual freedoms, increased governments' monitoring of citizens' behavior, and dramatically changed how students learn, how employees work, and how people interact with each other.

For social scientists and policymakers, the COVID-19 pandemic has raised important theoretical and practical questions related to social behavior. One of the primary questions that has surfaced was how to align individual behavior with the guidelines set by public health officials as a means to slow the rate of transmission and enhance governments' ability to respond effectively to the pandemic (Gollwitzer et al., 2020; Jordan, Yoelli & Rand, 2020; Van Bavel et al., 2020). The individual behaviors suggested by public health experts, and in many cases encouraged or mandated by authorities, require individuals to fundamentally alter how they interact with others. They also require individuals to think about how their own actions, and the actions of others (e.g., the ex-

tent to which their friends, neighbors, and coworkers follow social distancing guidelines), influence their own and others' health outcomes. Hence, from a theoretical standpoint, strategic thinking — defined as reasoning about how interdependent parties can influence their own and others' outcomes — should explain to some degree individual behavior in the context of the COVID-19 pandemic. The current research investigated how complementary aspects of strategic thinking relate to socially responsible behavior in context of the COVID-19 pandemic.

I propose that strategic thinking constitutes an important psychological factor that can help explain people's behavior during the COVID-19 pandemic. The next section elaborates on the concept of strategic thinking. I then report findings from an exploratory study that used different components of strategic thinking to predict compliance with social distancing guidelines and donation of money to medical organizations during the COVID-19 pandemic. The current research focused on these specific behaviors as they were seen as particularly important at the time the study took place (March 26, 2020). Complying with social distancing restrictions was essential for curtailing the spread of the virus, and many health organizations solicited donations from the public, which were seen as essential in fighting COVID-19 (e.g., <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/donate>).

### 1.1 Strategic Thinking and Behavior

Strategic thinking is a ubiquitous and multifaceted mental process whereby individuals think through how their own and others' actions influence their own and others' outcomes (Halevy, 2016). Situations that call for strategic thinking are characterized by multiple (i.e., two or more) actors, courses

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\*Graduate School of Business, Stanford University, 655 Knight Way, Stanford, CA 94035. Email: [nhalevy@stanford.edu](mailto:nhalevy@stanford.edu). ORCID: 0000-0001-5491-6979.

TABLE 1: A schematic account of strategic orientations based on the foci of attention in social decision making.

		Outcomes	
		Self	Other
Actions	Self	Egocentric	Impact
	Other	Dependency	Altercentric

of action, and potential outcomes. Hence, decision makers may attend to different actors (e.g., ego versus alters in one’s social network: Halevy, Halali & Zlatev, 2019; Nakashima, Halali & Halevy, 2017), different courses of action (e.g., cooperation vs. competition: Halevy & Chou, 2014), and different levels of possible outcomes (e.g., best-case versus worst-case outcomes: Halevy, Cohen, Chou, Katz & Panter, 2014) to varying degrees. Building on the idea that decision makers often attend to certain aspects of social situations more than to others (Adams, Sagiv & Licht, 2011; Mitchell, Agle, Wood, 1997; Occasio, 1997; Orquin & Mueller Loose, 2013), I propose that uncovering which aspects are most salient to decision makers can aid in explaining and predicting their behavior.

Table 1 provides a schematic account of how different foci of attention in social decision making situations give rise to different strategic orientations. Specifically, I propose that decision makers can focus their attention on themselves versus on others when thinking about possible courses of action as well as when thinking about potential outcomes. I propose further that crossing these foci of attention results in four strategic orientations. The *egocentric* strategic orientation reflects a focus on how one’s actions shape one’s outcomes. The *impact* strategic orientation reflects a focus on how one’s actions shape others’ outcomes. The *dependency* strategic orientation reflects a focus on how others’ actions shape one’s outcomes. Finally, the *altercentric* strategic orientation reflects a focus on how others’ actions shape their outcomes.

Unpacking strategic thinking to distinguish these four strategic orientations is consistent with interdependence theory’s practice of unpacking payoff matrices to their principal components to explain how individuals influence their own and others’ behavior and outcomes in social interactions and relationships (Kelley et al., 2003; Kelley & Thibaut, 1978; Rusbult & Van Lange, 2003). Importantly, strategic orientations are **not** mutually exclusive “types” of decision makers. Rather, they are modes of thinking that coexist side-by-side to varying degrees within each decision maker depending on how they allocate their attention over the different aspects of a given decision making situation. The allocation of attention to different aspects of the situation, and the ensuing strategic orientations, can be shaped by both person and situation variables in a given setting.

Recent research on strategic thinking from this perspective (Halevy, Alzahawi & Dannals, 2020) has shown that these four strategic orientations are distinct from other epistemic processes and preferences, including need for cognition (Cacioppo & Petty, 1982), need for cognitive closure (Webster & Kruglanski, 1994), and tendencies for cognitive reflection (Frederick, 2005). It has also shown that these four strategic orientations are distinct from social motives (e.g., power and benevolence values: Schwartz, 1992) and interpersonal tendencies to engage with others cognitively and emotionally (i.e., perspective-taking and empathetic concern: Davis, 1983). Finally, the studies conducted by Halevy et al. (2020) show that different strategic orientations differentially predict behavior in well-defined, incentivized economic games, such as Stag-Hunt (Skyrms, 2004), Dictator, and Ultimatum Bargaining (Sivanathan, Pillutla, & Murnighan, 2008).

## 1.2 The Current Research

Previous field studies of strategic thinking and behavior have: (a) operationalized depth of strategic thinking in terms of the number of steps of iterated reasoning decision makers engage in; and (b) studied strategic thinking primarily in the context of antagonistic economic interactions between individuals and organizations (e.g., Brown, Camerer, & Lovallo, 2012; Goldfarb & Xiao, 2011; Ostling et al., 2011). The goal of the exploratory study reported here was to utilize a novel, multi-faceted conceptualization and measure of strategic thinking to examine how different components of strategic thinking (i.e., different strategic orientations) predict socially responsible behavior by individuals during a pandemic.

The data for this exploratory study was collected on March 26, 2020. Based on data published by the World Health Organization, there were 478,126 confirmed cases and 24,247 deaths associated with the pandemic worldwide on that date. Four months later, on July 26, 2020, there were 15,785,641 confirmed cases and 640,016 deaths associated with the pandemic worldwide. Two themes emerged consistently in news coverage of the COVID-19 pandemic during March 2020. The first theme concerned the critical need to increase people’s compliance with social distancing guidelines as a means to curb the spread of the virus. Governments and local authorities in many locations have issued guidelines designed to minimize or slow down the spread of the virus, and issues related to the public’s compliance with some social distancing measures surfaced in the media. The second theme concerned the widespread shortage in essential medical supplies, such as facial masks and ventilators. In some cases, media reports indicated that this scarcity fueled fierce bidding wars for medical supplies.

Consistent with these themes, the current research focused on compliance with social distancing guidelines and donations of money to charitable organizations as two forms of socially responsible behavior during the COVID-19 pandemic.

Applying the theoretical framework of the four strategic orientations suggested above to individual thinking and behavior in the context of the COVID-19 pandemic suggests that decision makers facing a strategic decision problem (such as whether or how much to comply with social distancing guidelines, as well as whether to donate money to charitable organizations in need of funding during the pandemic) may focus their attention to varying degrees on: (a) how my actions will shape my outcomes (the egocentric strategic orientation); (b) how my actions will shape others' outcomes (the impact strategic orientation); (c) how others' actions will shape my outcomes (the dependency strategic orientation); and (d) how others' actions will shape their outcomes (the altercentric strategic orientation). The current research assessed how individuals' propensity to think through each of these strategic orientations related to their behavior during the pandemic.

### 1.3 Method

The preregistration for this exploratory study is available here: <https://aspredicted.org/blind.php?x=ks89xu>. The study materials and data are available here: [https://osf.io/4tx3b/?view\\_only=686576ff99b54d00b04852fed1e828ed](https://osf.io/4tx3b/?view_only=686576ff99b54d00b04852fed1e828ed).

### 1.4 Participants & Procedure

Consistent with the preregistration, I aimed to recruit 1,000 participants from various countries via Prolific Academic. Sensitivity analysis using GPower3.1 showed that this sample size has 95% power to detect a correlation of  $|\text{.052}|$  (Cronbach's  $\alpha=.05$ ). A total of 1,025 sessions were recorded in Qualtrics. In line with the preregistered exclusion criterion, I excluded 20 observations from participants who attempted to complete the study multiple times (based on repeated Prolific participant IDs), resulting in a final sample size of 995 unique participants who completed the entire survey (and several additional participants who completed portions of it; see Table 2 for the sample size for each measure).

Participants (58.6% male, age:  $M=28.3$ ,  $SD=9.8$ , range: 18 to 80), represented residents of many different countries, including the United Kingdom (26%), Poland (16.3%), Portugal (11.8%), the United States (11.6%), Italy (4.8%), Canada (4.6%), Spain (3.5%), Hungary (1.8%), France (1.7%), Germany (1.6%), and more (e.g., Australia, Chile, Denmark, Finland, Greece, Israel, Mexico, the Netherlands, New Zealand, Sweden, and Switzerland; see notes #2 and #5 for more information and analyses that consider participants' countries of residence). All responses were collected on March 26, 2020.

## 1.5 Measures

All the measures included in the study are reported below in the order they appeared in the survey. All the measures below used 7-pt scales ranging from 1=*Strongly disagree* to 7=*Strongly agree*, unless specified otherwise.

**Experiences of Threat.** After providing consent, participants responded to seven items that assessed their experiences of threat in the context of the pandemic: "The spread of Corona virus (COVID-19) poses a serious threat to... (a) people's lives; (b) people's physical and mental health; (c) people's employment and economic well-being; (d) social relations between people; (e) the rule of democracy; (f) individual rights and freedoms; and (g) poses an overall unprecedented threat to human societies". The order in which these items were presented was randomly determined for each participant ( $\alpha=.74$ ).

**Feelings of Hope.** Participants subsequently responded to seven items that assessed their feelings of hope in the context of the pandemic: "When I think about the spread of the Corona virus (COVID-19) I feel hope about: (a) people's lives; (b) people's physical and mental health; (c) people's employment and economic well-being; (d) social relations between people; (e) the rule of democracy; (f) individual rights and freedoms; and (g) the overall threat to human societies". The order in which items were presented was randomly determined for each participant ( $\alpha=.91$ ). Experiences of threat and feelings of hope served as control variables in the analyses.

**Strategic Thinking and Behavior.** Participants subsequently responded to two survey blocks with measures that captured strategic thinking and behavior. One block focused on compliance with social distancing guidelines and the other block focused on donation of money to medical organizations. The order in which these two blocks were presented was randomly determined for each participant.

**Strategic Thinking and Compliance with Social Distancing Guidelines.** Participants responded to 12 items that assessed the four strategic orientations (as four complementary aspects of strategic thinking) in the context of the pandemic. The instructions for the Strategic Thinking Scale applied to this context read as follows: "In many locations around the globe, authorities have introduced new regulations and restrictions limiting face-to-face contact between people as a means to combat the spread of COVID-19 (the corona virus). People vary in how much they personally follow these new regulations and restrictions. As you are contemplating whether or how much to follow these new regulations and restrictions, so are many other people. Please indicate how much you think about each of the following considerations when deciding whether or not (or how much) to follow

these new regulations and restrictions. When making this decision..."

These instructions were followed by the 12-item Strategic Thinking Scale (henceforth STS) taken from Halevy et al. (2020). The first three items captured the egocentric strategic orientation (i.e., thinking about how my actions shape my outcomes: "I think about how my decision will influence me"; "I think about how the choice I make will shape my outcome"; and "I think about the consequences of my action for me." ( $\alpha=.84$ ). The next three items captured the dependency strategic orientation (i.e., thinking about how others' actions shape my outcomes): "I think about how others' decisions will influence me"; "I think about how the choices others make will shape my outcome"; and "I think about the consequences of others' actions for me" ( $\alpha=.82$ ). The following three items captured the impact strategic orientation (i.e., thinking about how my actions shape others' outcomes): "I think about how my decision will influence others"; "I think about how the choice I make will influence other people"; and "I think about the consequences of my action for other people" ( $\alpha = .86$ ). Finally, the last three items in this measure captured the altercentric strategic orientation (i.e., thinking about how others' actions shape their outcomes): "I think about how others' decisions will influence them"; "I think about how the choices others make will shape their outcomes"; and "I think about the consequences of others' actions for them" ( $\alpha=.89$ ). The order in which these 12 items were presented was randomly determined for each participant. An exploratory factor analysis indicated that these 12 items loaded on the four factors as conceptualized in Table 1.<sup>1</sup>

After reporting their strategic thinking concerning the new social distancing guidelines, each participant responded to a single item that served as the first dependent measure: "How likely are you to follow the new regulations and restrictions to their full extent in the next seven days?" Participants indicated their response using a 7-pt scale ranging from 1=*Extremely unlikely* to 7=*Extremely likely*. Participants subsequently responded to two additional items that captured their past behavior and expectations regarding others' behavior (i.e., perceptions of the descriptive norm), which served as control variables. These items read as follows: "In the past seven days, to what extent have you followed the new regulations and restrictions to their full extent?" (using a 5-pt

<sup>1</sup>A principal component analysis on the 12 items of the strategic thinking scale (in the context of social distancing restrictions), specifying four factors and using promax rotation, indicated that the four strategic orientations are distinct yet interrelated. All items loaded on their intended factors. Item loadings ranged from .814 to .907 for the egocentric orientation; from .783 to .923 for the dependency orientation; from .861 to .903 for the impact orientation; and from .882 to .919 for the altercentric orientation. Items did not load highly on factors other than their intended factor (all cross-loadings <.15). The four factors jointly explained 77.76% of the variance. Correlations between the extracted components ranged from .29 to .56.

scale ranging from 1=*Not at all* to 5=*Completely*, 6=*Not Applicable*)<sup>2</sup>; "In your opinion, what percentage of the people in your community are likely to follow the new regulations and restrictions to their full extent in the next seven days? (Please enter a number between 0 and 100 only)".

**Strategic Thinking and Donating Money to Charitable Organizations.** The second dependent measure in the current study was assessed as follows. Each participant then learned that the study gave them \$0.50 (in addition to the \$1 they received for completing the study) that they could either keep to themselves or donate to charitable organizations. Before making this binary choice, participants completed the same set of strategic thinking items noted above (i.e., the 12-item STS), this time to assess the four strategic orientations (as complementary aspects of strategic thinking) in the context of donating money to charitable organizations during the pandemic. The instructions for this measure read as follows:

The shortage of medical supplies in many locations around the globe has led charities to seek donations from the public to help fight the Corona virus (COVID-19). People vary in how much they personally give to medical charities in general and at this time in particular. On the next page of the survey, you will have a choice to make. You, and each participant in this study, will receive \$0.50 in addition to their fixed payment of \$1 for completing this study. You can choose below to either keep the \$0.50 to yourself or have us donate it to the Red Cross/Crescent (or an equivalent health organization) in your country to help fight the Corona virus (COVID-19). If more than 50% of people will choose to donate their \$0.50, we will donate an additional \$100 to help fight coronavirus. Before making this choice, please indicate how much you think about each of the following considerations when deciding whether or not to donate the \$0.50. When making this decision right now,...".

The text referring to the possibility of adding \$100 to the donation if a majority of the participants will choose to donate their money was capitalized in the instructions to emphasize the interdependence between different people's choices. This particular aspect of the instructions created

<sup>2</sup>Different communities and countries introduced different restrictive policies to curb the transmission of the COVID-19 virus. Given the variability in such public policies, the questions pertaining to: (a) intentions to comply with social distancing regulations and restrictions in the next seven days; (b) compliance with social distancing regulations and restrictions in the past seven days; and (c) perceived behavioral norms in their community, were intentionally phrased using broad terms that captured that variability. The broad applicability and relevance of these items is evident from the fact that only 1.5% of the participants (n=15) responded to the question about their compliance with social distancing restrictions in the past seven days by choosing the option: "not applicable — there are no new, corona-related regulations and restrictions in my community".

TABLE 2: Descriptive statistics and correlations among the research variables. ( $r=.06$  is  $p<.05$ ;  $r=.08$  is  $p<.01$ ;  $r=.11$  is  $p<.001$ ).

	<i>N</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Egocentric SO: Compliance	998	5.92	1.02	....	....	....	....	....	....	....	....	....	....	....	....	....	....
2. Dependency SO: Compliance	998	5.45	1.22	.58	....	....	....	....	....	....	....	....	....	....	....	....	....
3. Impact SO: Compliance	998	5.81	1.10	.37	.49	....	....	....	....	....	....	....	....	....	....	....	....
4. Altercentric SO: Compliance	998	4.97	1.35	.29	.46	.48	....	....	....	....	....	....	....	....	....	....	....
5. Egocentric SO: Giving	997	5.40	1.36	.43	.29	.16	.17	....	....	....	....	....	....	....	....	....	....
6. Dependency SO: Giving	997	4.59	1.62	.25	.39	.19	.32	.55	....	....	....	....	....	....	....	....	....
7. Impact SO: Giving	997	5.45	1.27	.22	.34	.56	.36	.24	.39	....	....	....	....	....	....	....	....
8. Altercentric SO: Giving	997	4.51	1.53	.20	.29	.29	.57	.32	.65	.51	....	....	....	....	....	....	....
9. Intentions to comply	998	6.55	.85	.18	.23	.39	.21	.06	.05	.24	.14	....	....	....	....	....	....
10. Donation (1=yes, 0=no)	997	.727	.45	.03	.07	.22	.15	-.07	-.02	.25	.11	.17	....	....	....	....	....
11. Past compliance	997	4.61	.66	.07	.10	.26	.16	.04	.04	.18	.09	.58	.13	....	....	....	....
12. Expecting others to comply	997	69.88	18.01	-.03	.01	.05	.03	.04	.05	.00	.00	.12	-.06	.14	....	....	....
13. Expecting others to donate	997	62.82	24.14	.03	.07	.11	.08	-.10	-.05	.11	-.00	.09	.49	.05	.12	....	....
14. Experienced Threat	1,004	5.36	.89	.22	.23	.20	.24	.17	.23	.21	.26	.13	.03	.12	-.01	.02	....
15. Feelings of Hope	1,001	4.08	1.34	.03	.03	.08	.16	.09	.17	.09	.18	-.02	-.01	.04	.11	-.00	-.08

a step-level public good problem (Bornstein, 1992). That is, the public good (an additional donation of \$100) would be supplied only to the extent that a particular threshold is met. In this case, the contingency (which is conceptually similar to matching mechanisms used by many institutions; e.g., Gee & Schreck, 2018; Meier, 2007) was that a majority of the participants contributed their resources to this end.  $\alpha$  reliabilities for the four strategic thinking sub-scales in the context of the donation decision were as follows: egocentric orientation:  $\alpha=.87$ , dependency orientation:  $\alpha=.89$ , impact orientation:  $\alpha=.82$ , and altercentric orientation:  $\alpha=.89$ . An exploratory factor analysis indicated that these 12 items loaded on the four factors as conceptualized in Table 1.<sup>3</sup>

Participants subsequently reported their demographic characteristics and exited the online survey.

### 1.6 Results

Table 2 presents the sample sizes, means, standard deviations, and simple correlations among all the measures included in the study. Table 2 shows positive associations among the four strategic orientations within each domain (compliance with social distancing guidelines, donation decisions) as well as across the two domains. These positive

associations indicate that, despite the conceptual and empirical distinctiveness of the four strategic orientations, they share a common core (a tendency to cogitate more, rather than less, when faced with a strategic decision problem). Table 2 shows that intentions to comply with social distancing guidelines correlated positively with all four strategic orientations (ranging from  $r=.18$  to  $r=.39^4$ ). Intentions to comply correlated strongly with past compliance ( $r=.58$ ), but only weakly with expectations that others will comply ( $r=.12$ ). Choosing to donate the money correlated positively with the impact ( $r=.25$ ) and altercentric ( $r=.11$ ) strategic orientations, was unrelated to the dependency strategic orientation, and negatively (though weakly) associated the egocentric orientation. Choosing to donate the money correlated strongly with the expectations that many others will donate ( $r=.49$ ), but only weakly with intentions to comply with social distancing guidelines ( $r=.17$ ). Finally, Table 2 also shows that experiencing threat in the context of the COVID-19 pandemic correlated positively with thinking strategically about both decision problems — the greater the threat participants experienced, the higher were their scores on the four subscales of the STS (correlations ranged from  $r=.17$  to  $r=.26$ ). Unlike threat experiences, feelings of hope in the context of the pandemic did not show a consistent pattern of association with the four strategic orientations. The associations between the four subscales of the STS and the other variables of interest as depicted in Table 2 are largely comparable in magnitude to the effect size benchmarks in social psychology (Richard, Bond & Stokes-Zoota, 2003) and applied psychology (Bosco et al., 2015).

<sup>3</sup>A principal component analysis on the 12 items of the strategic thinking scale (in the context of donation decisions), specifying four factors and using promax rotation, indicated that the four strategic orientations are distinct yet interrelated. All items loaded on their intended factors. Item loadings ranged from .866 to .881 for the egocentric orientation; from .797 to .899 for the dependency orientation; from .779 to .892 for the impact orientation; and from .853 to .908 for the altercentric orientation. Items did not load highly on factors other than their intended factor (all cross-loadings  $<.311$ ). The four factors jointly explained 79.68% of the variance. Correlations between the extracted components ranged from .23 to .60.

<sup>4</sup>All correlations reported in the text are significant at the .001 level unless noted otherwise.

TABLE 3: Strategic thinking and demographic characteristics predicting compliance with social distancing restrictions during the pandemic.

	Model 1		Model 2		Model 3	
	B (SE)	$\beta$	B (SE)	$\beta$	B (SE)	$\beta$
Strategic Thinking						
Egocentric SO: Compliance	.024 (.030)	.028			.033 (.026)	.040
Dependency SO: Compliance	.019 (.028)	.028			.025 (.023)	.036
Impact SO: Compliance	.278 (.028)	.358**			.175 (.024)	.226**
Altercentric SO: Compliance	.011 (.022)	.017			-.005 (.019)	-.007
Past compliance			.723 (.034)	.562**	.659 (.033)	.512**
Expecting others to comply			.002 (.001)	.036	.001 (.001)	.031
Gender (1=female, 0=male)			.111 (.047)	.065*	.047 (.045)	.027
Age			.006 (.002)	.074*	.007 (.002)	.086*
Experienced Threat			.037 (.025)	.039	-.013 (.025)	-.014
Feelings of Hope			-.024 (.017)	-.038	-.04 (.016)	-.064*
Model <i>F</i>	45.23**		85.87**		66.27**	
Adjusted <i>R</i> <sup>2</sup>	.151		.344		.401	
<i>N</i>	997		973		973	

Note. \* $p < .05$ , \*\* $p < .001$ . SO=strategic orientation.

Table 3 presents the results of linear regression analyses predicting people’s behavioral intentions to comply with new social distancing guidelines during the pandemic. Model 1 in Table 3 shows that the more individuals think about how their own actions shape others’ outcomes (i.e., the impact strategic orientation), the more likely they are to comply with the new social distancing guidelines ( $\beta = .36, p < .001$ ). Model 3 in Table 3 shows that this positive association remains significant ( $\beta = .23, p < .001$ ) after adjusting for individuals’ past compliance with social distancing guidelines (which is the strongest predictor of intentions to comply in the future), their gender, age, expecting others to comply, experiences of threat, and feelings of hope. Table 3 shows further that women were significantly more likely than men to comply with social distancing guidelines (Model 2), and that age related positively to intentions to comply with social distancing guidelines (Models 2 and 3). Importantly, the four strategic orientations jointly explained 15.1% of the variance in behavioral intentions to comply with social distancing guidelines (Table 3, Model 1). Interestingly, hope showed a significant (though weak) negative association with intentions to comply with social distancing guidelines (Table 3, Model 3), suggesting that hope can be associated with counterproductive behaviors in this context (in contrast to Halevy, 2017).

Table 4 presents the results of logistic regression analyses predicting people’s actual donations of the money the study provided them to charitable organizations during the pandemic. Model 1 in Table 4 shows that all four strategic

orientations explained unique variance in decisions to donate the money received in the study to charitable organizations. The four strategic orientations jointly explained 12.3% of the variance in actual giving. Importantly, whereas Model 1 shows negative coefficients for thinking about one’s personal outcomes (i.e., the egocentric and dependency strategic orientations), it shows positive coefficients for thinking about others’ outcomes (i.e., the impact and altercentric strategic orientations). This pattern largely held in Model 3 in Table 4, in which three of the four components of strategic thinking (the dependency, impact, and altercentric strategic orientations) retained their explanatory value after adjusting for donation expectations, gender, age, experiences of threat, and feelings of hope. Notably, an increase of one unit in thinking about how one’s own actions shape others’ outcomes (i.e., the impact strategic orientation) increased giving by 62% (Model 3, Table 4). This effect emerged after adjusting for participants’ gender (among other predictors), which also predicted charitable giving in this study.

## 2 Discussion

The current paper introduced a multifaceted conceptualization of strategic thinking that is based on decision makers’ attention allocation in social decision making situations, and a corresponding measure — the Strategic Thinking Scale. An exploratory study that utilized these tools illustrated their usefulness for explaining and predicting individual behavior in the context of the COVID-19 pandemic. The findings

TABLE 4: Strategic thinking and demographic characteristics predicting donations of money to charitable organizations during the pandemic.

Strategic Thinking	Model 1		Model 2		Model 3	
	B (SE)	Odds Ratio	B (SE)	Odds Ratio	B (SE)	Odds Ratio
Egocentric SO: Donation	-.172 (.071)	.842*			-.107 (.083)	.898
Dependency SO: Donation	-.241 (.073)	.786*			-.244 (.082)	.784*
Impact SO: Donation	.520 (.072)	1.682**			.482 (.084)	1.619**
Altercentric SO: Donation	.142 (.071)	1.152*			.189 (.083)	1.208*
Expecting others to give			.052 (.004)	1.053**	.052 (.004)	1.053**
Gender (1=female, 0=male)			.825 (.186)	2.281**	.716 (.196)	2.046**
Age			-.010 (.009)	.990	-.002 (.010)	.998
Experienced Threat			.044 (.094)	1.045	-.062 (.105)	.940
Feelings of Hope			.025 (.063)	1.025	-.017 (.067)	.983
Model $\chi^2$	88.51**		268.85**		327.54**	
Nagelkerke $R^2$	.123		.344		.408	
<i>N</i>	997		989		989	

Note. \* $p < .05$ , \*\* $p < .001$ . SO=strategic orientation.

show that self-reported strategic thinking in the context of a dynamic and high-stakes collective event explains considerable portions of the variance in two important outcome measures — behavioral intentions to comply with social distancing guidelines and actual donation of money to charitable organizations. The findings also demonstrate the significance of distinguishing different components of strategic thinking, conceptualized here as distinct (though interrelated) strategic orientations that reflect attending to different foci in social decision making situations. Specifically, thinking about one’s own outcomes — either about one’s agency and control over one’s personal outcomes (the egocentric strategic orientation) or about one’s vulnerability to, and dependence on, others’ actions (the dependency strategic orientation) — was unrelated to compliance with social distancing guidelines and showed a negative association with donations. In contrast, thinking about others’ outcomes, and more specifically, about how one’s actions shape the consequences that others experience (the impact strategic orientation), positively predicted both behavioral intentions to comply with social distancing guidelines and actual donations of money during the pandemic.

### 2.1 Theoretical and Methodological Implications

The main theoretical contribution of the current paper is in offering a novel conceptualization of strategic thinking that challenges and complements prevailing conceptualizations. Prevailing models of strategic thinking conceptualize it as an antagonistic cognitive process whereby individuals

try to thwart their rivals by engaging in more steps of iterated reasoning than their competition (Brown et al., 2012; Camerer, 2003; Camerer, Ho & Chong, 2015; Goldfarb & Xiao, 2011). Thus, common conceptualizations of strategic thinking utilize terms such as “adversary” and “competitor” in their definitions. For example, Dixit and Nalebuff (1991, p. ix) noted: “strategic thinking is the art of outdoing an adversary, knowing that the adversary is trying to do the same to you”, and Levine, Bernard and Nagel (2017, p. 2392) defined strategic intelligence as “the ability to anticipate competitors’ behavior and preempt it”. Consistent with such conceptualizations, studies of strategic thinking often use zero-sum, dominance-solvable games to study strategic thinking (e.g., Chou, McConnel & Nagel, 2009; Fehr & Huck, 2016; Nagel, 1995). These are competitive strategic interactions in which the game can be “solved” through a step-by-step reasoning process whereby individuals iteratively rule out dominated strategies one at a time under an assumption of mutual rationality of the players (Crawford, 2013). Cognitive hierarchy (Camerer, 2003; Camerer et al., 2015) and level-*k* models (Arad & Rubinstein, 2012; Nagel, 1995) take an individual-difference approach to strategic thinking. They distinguish between deep and shallow strategic thinkers based on the number of steps of iterated reasoning they employ in such games (which are inferred from participants’ behavioral choices rather than measured directly). Unlike shallow strategic thinkers, deep strategic thinkers engage in more steps of iterated reasoning and choose strategies that best-respond to their beliefs about others’ likely choices.

The current conceptualization of strategic thinking challenges and complements these prevailing models in two im-

portant ways. First, it does not assume that strategic thinking is inherently antagonistic. Rather, it acknowledges that thinking about different actors, their possible actions, and the potential outcomes they may experience, can also play an important role in promoting coordination and collaboration in dyads and groups (Cosmides, 1989; De Freitas, Thomas, DeScioli & Pinker, 2019; De Kwaadsteniet & Van Dijk, 2010; Silva & Mousavidin, 2015; Takagishi et al., 2010; Thomas, DeScioli, Haque & Pinker, 2014). Hence, the current conceptualization of strategic thinking makes it applicable across a wide range of social situations characterized by outcome interdependence (Gerpott et al., 2018; Halevy, Chou & Murnighan, 2012; Halevy & Phillips, 2015). Second, the current conceptualization of strategic thinking replaces the unidimensional focus on number of steps of iterated reasoning as the sole criterion for depth of strategic reasoning with a multifaceted framework that builds on the notion that decision makers may allocate their attention differentially to different actors, courses of action, and potential outcomes in strategic interactions (Adams et al., 2011; Halevy, 2016; Halevy & Chou, 2014; Ocasio, 1997). Considering different foci in social decision making resulted in four strategic orientations — the egocentric, dependency, impact, and altercentric strategic orientations — which jointly provide a well-rounded conceptualization of strategic thinking.

The main methodological contribution of the current paper is in introducing the Strategic Thinking Scale (STS) as a tool for assessing the egocentric, dependency, impact, and altercentric strategic orientations. The current research illustrates the usefulness of this 12-item measure for studying individual thinking and behavior in the context of a consequential, ongoing collective event. The broad applicability of the proposed multifaceted model is mirrored in the broad applicability of the STS, which can be applied to studying individual thinking and behavior across a wide range of interactive contexts.

## 2.2 Empirical and Practical Implications

Alongside the aforementioned theoretical and methodological contributions, the exploratory study reported in this paper also has potential empirical and practical implications. First, the findings enhance our understanding of strategic thinking by showing that different strategic orientations are distinct yet interrelated. Despite the modest association between intentions to comply with social distancing guidelines and donation of money in the current study, strategic thinking about the first decision problem correlated positively with strategic thinking about the second decision problem.<sup>5</sup> Fu-

<sup>5</sup>The 12 items of the strategic thinking scale (STS) were administered twice, once in relation to intentions to comply with social distancing guidelines and a second time in relation to choices to donate the money received in the study to charitable organizations. Whereas Tables 3 and 4 report

ture research may examine the generalizability of this pattern across different decision contexts. Second, the current findings enhance our understanding of the factors that shape socially responsible behavior by the public during an escalating pandemic that has altered the lives of individuals, communities, and entire societies dramatically. Specifically, the results indicate that the impact strategic orientation, that is, thinking about how one's actions influence others' outcomes, correlated positively with past compliance with social distancing guidelines, with intentions to comply with social distancing guidelines in the future, and with actual donation of money in the study. Future research is required to examine the extent to which this insight can be implemented to design beneficial large-scale interventions that focus on supporting individual thinking through the impact strategic orientation.

## 2.3 Strengths, Limitations, and Future Directions

Its exploratory nature notwithstanding, the fact that the current research was highly powered, used a diverse sample of respondents from many different countries, and studied consequential behaviors in real time (i.e., when individuals were grappling with these issues in their communities) are notable strengths of the current paper. At the same time, however, the current research has several limitations that offer promising directions for future research on strategic thinking and behavior.

First, whereas the current study assessed actual donation decisions, it relied on self-reports to assess past compliance, and intentions to comply in the future, with social distancing guidelines. Future research may seek to supplement such

results from regression analyses that use each set of STS items to predict the matching outcome variable, it is also possible to regress each outcome variable on the other set of STS items (i.e., assessed in relation to the other outcome variable).

Using the four strategic orientation scores assessed in relation to donating money to predict compliance with social distancing restrictions and regulations showed that the four orientations jointly explained 6% of the variance (Adj.  $R^2=0.060$ ,  $F(4,992)=16.95$ ,  $p<.001$ ; compared to 15.1% when using the outcome-specific STS items, Table 3, Model 1). The standardized coefficients of the four strategic orientations were as follows: egocentric:  $\beta=.045$ ,  $p=.222$ , dependency:  $\beta=-.114$ ,  $p=.013$ , impact:  $\beta=.234$ ,  $p<.001$ , and altercentric:  $\beta=.078$ ,  $p=.070$ .

Using the four strategic orientation scores assessed in relation to compliance with social distancing restrictions and regulations to predict in a logistic regression choices to donate the money showed that the four orientations jointly explained 7.2% of the variance (Nagelkerke's  $R^2=0.072$ ,  $\chi^2(4)=51.09$ ,  $p<.001$ ; compared to 12.3% when using the outcome-specific STS items, Table 4, Model 1). The odds ratio values for the four strategic orientations were as follows: egocentric:  $OR=.906$ ,  $p=.273$ , dependency:  $OR=.921$ ,  $p=.319$ , impact:  $OR=1.545$ ,  $p<.001$ , and altercentric:  $OR=1.126$ ,  $p=.059$ . Thus, consistent with the positive associations between strategic thinking scores as assessed in relation to these two decisions (depicted in Table 2), the two sets of responses to the STS items predicted both the corresponding outcome variable and the other outcome variable. At the same time, responses to each set of STS items predicted the corresponding outcome measure more strongly than they predicted the other outcome measure.



self-reports with other-reports to overcome the established limitations of self-report measures. Second, recall that the instructions for the donation decision explicitly highlighted the strategic nature of the donation decision by articulating that the research team will donate additional money if more than 50% of the study participants will choose to donate their money (similar to donation matching mechanisms that many institutions employ). Future research may directly examine the extent to which this particular feature moderates the observed relations between strategic orientations and donation behavior. Third, participants were prompted to think about how their own actions and others' actions influence their own and others' outcomes by virtue of completing the 12-item STS prior to reporting their compliance with social distancing guidelines and making their donation decision. This particular procedure may have strengthened the observed associations between self-reported strategic orientations and the two outcome measures studied in the current research. Future research may use alternative procedures to reduce the extent to which measuring strategic thinking primes individuals or induces them to think more thoroughly and systematically about interactive decision problems than they otherwise would. Fourth, the correlational nature of the current research precludes the possibility of claiming that strategic thinking caused the strategic behaviors assessed in this study. Research on strategic thinking typically measures, rather than manipulates, this mental process (e.g., Burks, Carpenter, Goette & Rustichini, 2009; Camerer, 2003; Carpenter, Graham & Wolf, 2013; Coricelli & Nagel, 2009). Nonetheless, future research may seek to experimentally manipulate decision makers' strategic thinking as a means to investigate causal effects of strategic orientations on social decision making. Fifth, the inclusion of participants from many different countries in the current study raises the possibilities that different participants may have interpreted the items of the strategic thinking scale differently, valued the donation amount of \$0.50 differently, and have thought differently about the meaning of compliance with social distancing guidelines (e.g., due to differences in the number of confirmed infections in their community, the nature and number of the social distancing guidelines in their community, or the degree to which social distancing guidelines were formally enforced by authorities).<sup>6</sup> Future

<sup>6</sup>Study participants were residents of many different countries that vary along multiple dimensions (including the spread of the pandemic at the time of the study, the enforcement of social distancing restrictions at the time of the study, cultural tightness-looseness, level of economic development, and more). Further, pandemic-related phenomena varied considerably across different regions and communities within countries. To explore whether strategic orientations retain their explanatory power when considering the variability in participants' countries of residence in the current sample, I conducted exploratory analyses in which I added dummy-coded variables for the largest groups of participants (that jointly account for 781/1005 of the observations: Spain, Portugal and Italy combined,  $N=199$ ; Poland,  $N=162$ ; and the U.S. and Canada combined,  $N=161$ ; the UK,  $N=259$ , served as the reference category in these analyses).

research is required to establish the meaningfulness of the strategic thinking items in different cultural contexts and to systematically explore the role of community-level factors (cultural, economic, and pandemic-related) in shaping social behavior during the COVID-19 pandemic. The choice to focus on individual-level predictors of compliance with social distancing guidelines and donation decisions was motivated by the theoretical interest in individuals' strategic thinking. Future research may enhance our understanding of individual reactions to the COVID-19 pandemic and other collective events by employing multilevel models that consider individual-level factors (e.g., strategic orientations, gender, age) alongside group-level factors (e.g., the size and density of individuals' social networks; economic and cultural characteristics of participants' country of residence, and more) to predict outcome measures of interest. For example, future research may integrate individual-level characteristics with community-level characteristics (such as the number of confirmed infections in the community, the number of social distancing orders in the community, and levels of civic engagement and social capital in a given community; Barrios, Benmelech, Hochberg, Sapienza & Zingales, 2020; Ding, Levine, Lin & Xie, 2020). Such multilevel models may be able to explain a substantial portion of the variance in social behavior in the context of the COVID-19 pandemic and other collective events.

Some of the findings of the current research similarly offer interesting directions for future research on strategic thinking and behavior. For example, whereas Table 3 shows that only the impact strategic orientation is significantly associated with greater intentions to comply with social distancing guidelines, Table 4 shows significant associations (in opposite directions) between multiple strategic orientations and donation decision. The two outcome measures are clearly distinct (as evident from the weak positive association between them). Nonetheless, it may be worthwhile to speculate

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Replicating the findings of Model 1 in Table 3, a linear regression analysis predicting intentions to comply with social distancing guidelines indicated non-significant coefficients for the egocentric ( $B=.055$ ,  $SE=.036$ ,  $p=.12$ ), dependency ( $B=.025$ ,  $SE=.033$ ,  $p=.44$ ), and altercentric ( $B=-.007$ ,  $SE=.026$ ,  $p=.79$ ) strategic orientations, and a significant positive coefficient for the impact strategic orientation ( $B=.25$ ,  $SE=.032$ ,  $p<.001$ ). The coefficients for the U.S. and Canada ( $B=-.305$ ,  $SE=.082$ ,  $p<.001$ ) and Poland ( $B=-.238$ ,  $SE=.083$ ,  $p=.004$ ) were significant, whereas the coefficient for Spain, Italy, and Portugal was not ( $B=-.039$ ,  $SE=.076$ ,  $p=.61$ ).

Largely replicating the findings of Model 1 in Table 4, a logistic regression analysis predicting donation decisions indicated significant coefficients for the egocentric ( $B=-.202$ ,  $SE=.085$ ,  $p=.018$ ), dependency ( $B=-.175$ ,  $SE=.082$ ,  $p=.033$ ), and impact strategic orientations ( $B=.565$ ,  $SE=.085$ ,  $p<.001$ ). The coefficient for the altercentric strategic orientation was not significant ( $B=.046$ ,  $SE=.080$ ,  $p=.56$ ). The coefficients for the U.S. and Canada ( $B=-.155$ ,  $SE=.242$ ,  $p=.52$ ) and Spain, Italy, and Portugal ( $B=-.046$ ,  $SE=.237$ ,  $p=.85$ ) were not significant, whereas the coefficient for Poland was significant ( $B=-.907$ ,  $SE=.228$ ,  $p<.001$ ).

Taken together, the findings for both exploratory regression analyses suggest that strategic orientations maintain their predictive value even when accounting for the countries of residence of the largest groups of participants in the study.

about the reasons for the discrepant patterns. One possibility is that charitable giving is unequivocally altruistic (because it benefits others at a cost to oneself) whereas compliance with social distancing may be considered a form of “tainted altruism” (Zlatev & Miller, 2016) as it potentially benefits (protects) oneself as well as others. Hence, strategic orientations that entail focusing one’s attention on one’s own outcomes show significant negative coefficients when predicting donation decisions (Table 4, Model 1), but not when predicting compliance with social distancing guidelines (Table 3, Model 1). Another possibility is that the explicit instructions concerning the additional donation by the research team, which created a step-level public good problem, altered how participants thought about the donation decision as compared to the how they thought about compliance with social distancing guidelines (which can be viewed as a social dilemma involving the provision of a continuous, rather than a step-level, public good). This possibility is supported by the finding that expecting others to give associated positively with donation decisions (Table 4), whereas expecting others to comply with social distancing guidelines was unrelated to intentions to comply (Table 3). Because the two outcome measures employed in the current study differ on multiple dimensions (e.g., in the stakes involved, in the assessment of actual behavior versus self-reported behavior), it is difficult to decisively determine why multiple strategic orientations associated significantly with donation decisions whereas only one strategic orientation associated significantly with intentions to comply with social distancing guidelines. However, it is important to note that across the two decision problems, the impact strategic orientation showed a robust positive association with socially responsible behavior.

Another intriguing empirical finding that warrants future research concerns the discrepancies that emerged between the simple correlations reported in Table 2 and the coefficients in the multiple regressions reported in Tables 3 and 4. Because the four strategic orientations are interrelated, using all four of them as simultaneous predictors of the two outcome measures resulted in a different pattern of associations. Specifically, whereas all four strategic orientations correlated positively with intentions to comply with social distancing guidelines in Table 2, only the coefficient for the impact strategic orientation was positive and significant in the regression analyses reported in Table 3. Future research should thus be mindful of the interrelations among the four strategic orientations when using them to predict outcome variables of interest. Finally, future research may also explore whether strategic orientations interact with experiences of threat, feelings of hope, and participants’ demographic characteristics in shaping strategic behavior.

## 2.4 Conclusion

Strategic thinking is a fascinating mental process. The current paper introduced a novel multifaceted conceptualization, and a corresponding self-report measure, of strategic thinking. Distinguishing between complementary components of strategic thinking based on the foci of decision makers’ attention proved useful for explaining individuals’ social behavior in the early stages of the COVID-19 pandemic. The findings of the exploratory study reported in this paper suggest that the egocentric, dependency, impact, and altercentric strategic orientations are distinct yet interrelated, and that the impact strategic orientation, in particular, positively predicts intentions to comply with social distancing guidelines and actual donations to charitable organizations. Future research may examine the extent to which strategic orientations, as conceptualized and measured in the current research, explain social behavior also in other contexts, beyond the current pandemic.

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