

The salience of choice reduces social responsibility: evidence from lab experiments and compliance with COVID-19 stay-at-home orders

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Abstract

The tension between self-interest and the collective good is fundamental to human societies. We propose that the idea of choice is a key lever that nudges people to act in a self-interested manner because it leads people to value independence. Making one inconsequential choice at the beginning of an incentive-compatible lab experiment made people 41% more likely to choose a monetary allocation that maximized their own payoff while minimizing the total payoff of their group (Studies 1A and 1B). The next two studies featured seven-participant experimental markets in which sellers decided whether to produce conventional goods (which imposed costs on others) or socially responsible goods (which did not impose any costs), and buyers decided which goods to purchase. In markets in which members made a single inconsequential choice, the market share of the socially responsible good was reduced by a factor of 34% (Studies 2A and 2B). In the context of the COVID-19 pandemic, framing socially responsible actions as choices increased people's willingness to hoard and violate social distancing rules (Study 3). Highlighting the idea of choice reduced people's desire to engage in corporate social responsibility, and this effect was mediated by an increased emphasis on independence (Study 4). Finally, using cell phone location data, an archival study found that in states in which people were more likely to search for choice-related words on the internet in 2019, residents were more likely to leave their homes following a stay-at-home order, after controlling for state-level income, education, diversity, population density, and political orientation (Study 5).

Keywords: choice, COVID-19, externalities, markets, social responsibility

Significance Statement:

To contain the COVID-19 pandemic, people need to act in a socially responsible manner (e.g. follow social distancing guidelines, not hoard). The current research found that making the concept of choice salient reduced people's willingness to act in a socially responsible manner. In states that emphasized choice more, people were less likely to follow government-issued stay-at-home orders. Surveys and incentive-compatible lab experiments conceptually replicated these findings—after making a single inconsequential choice, people were less likely to act in a socially responsible manner. Overall, the findings indicate that the increasing salience of choice can make it difficult for society to tackle multiple challenges of the 21st century that require people to act in a socially responsible manner.

Mitigating climate change, arresting environmental damage, and ensuring the welfare of farm, factory, and healthcare workers are some of the biggest challenges facing humankind in the 21st century. All these challenges share one feature in common—they require people to act in a socially responsible manner, that is, to consider the welfare of society as a whole (e.g. people in other continents, future generations, and nonhuman species), not just their own self-interest (1). Acting in a socially responsible manner is particularly important during times of crisis, such as the ongoing COVID-19 pandemic. If everyone acts in a socially responsible manner by wearing masks and maintaining social distancing,

then societies can suppress the virus and return to normality. If people act in a self-interested manner, then the pandemic would drag on and claim many more lives and livelihoods. In the present research, we ask whether the salience of choice reduces people's likelihood of acting in a socially responsible manner.

Extensive research in psychology has examined the positive and negative consequences of providing people with more options to choose from (2–6). However, choice is not just a matter of how many objective options people have—it is also a matter of construal or framing. Sometimes, people perceive the options available to them through a lens of choice (i.e. a choice mindset),

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and other times, they do not (7). Construing actions as choices influences people's judgments of others. For example, when in a choice mindset, people are more likely to blame victims of negative outcomes—they attribute the negative outcomes to victims' choices, and thus believe that victims deserve their outcomes (8). Further, when in a choice mindset, people are less concerned about income inequality—they think that the rich made good choices and the poor made bad choices, so inequality is justified (9).

Research in experimental economics has obtained similar findings. For example, when one individual received a high endowment and the other received a low endowment because of a purely random process, judges tended to redistribute the income among the two individuals to achieve a more equal final allocation. However, when individuals made one nominal (i.e. factually inconsequential) choice as part of the income allocation process, judges were less likely to redistribute the income (10, see (11) for a similar finding). These findings suggest that when the idea of choice is salient, people attribute individuals' outcomes to their choices, and thus are less likely to reduce income inequality through redistribution.

Some research has also found that the salience of choice can reduce people's concern for others. For example, in one experiment (8; Experiment 5), about half the participants were asked to choose one of five options for four different consumer items (i.e. pens, chocolate bars, keychains, and birthday cards); the remaining participants were asked to describe the options that the previous participant chose but without making any choice themselves. Thereafter, participants were presented with a description of a poor orphan accompanied with a photograph (purportedly taken from a charity's website), and asked how sympathetic they were to the orphan's plight. The researchers found that participants who had made a few consumer choices were less sympathetic toward the poor orphan than those who did not make any choices. This finding suggests that the salience of choice can reduce people's concern for disadvantaged others.

Recent research found that when the concept of choice is made salient, people emphasize the self over others and pay more attention to concepts related to independence (12). The enhanced emphasis on independence can serve as a mechanism that explains the diverse effects of the salience of choice discussed above. For example, the finding that highlighting the salience of choice leads people to think in a more analytic manner (13) is consistent with extensive research in cultural psychology showing that people in more independent cultures think in a more analytic manner (14). Similarly, the idea that the salience of choice leads people to value independence explains the finding that choice leads people to favor public policies that further individual rights over those that promote collective goods (8) and reduces people's concern with wealth inequality (9). As the value of independence leads people to emphasize individual responsibility over collective responsibility (15), we hypothesized that the salience of choice would reduce people's tendency to act in a socially responsible manner. We tested whether this would happen even in situations in which the increase in individuals' own welfare is dwarfed by the cost borne by third parties.

Past research manipulating the salience of choice has asked people to make choices among consumer goods, to recall their past choices, or to observe others make choices (8, 9, 13). In the current research, we used a more subtle experimental manipulation to alter the salience of choice. Specifically, we ask some people to make a *nominal choice*, that is, a choice that has absolutely

no impact on their final outcomes, and thus is factually inconsequential, that is, a choice in name only (10). We examine whether a subtle manipulation in which people either make or do not make *one nominal choice* before engaging in a multitrail economic interaction would increase the frequency with which they choose self-interested options; and in a market interaction, reduce the share of socially responsible goods that are ultimately transacted in the market over a large number of rounds. We use a novel manipulation of choice in the context of COVID-19. Specifically, we examine whether merely framing the decision of whether or not to engage in socially responsible behavior during a lockdown as a choice would reduce people's willingness to engage in socially responsible behavior.

We conducted seven studies to test this key hypothesis. We first assessed whether asking people to make a single, factually inconsequential choice leads them to make more self-interested decisions in a modified dictator game (Studies 1A and 1B), and in an experimental market consisting of buyers, sellers, and third parties who are affected by socially irresponsible decisions (Studies 2A and 2B). Study 3 tested whether framing socially responsible behavior in the context of COVID-19 in terms of choice would reduce people's willingness to engage in those behaviors. Study 4 investigated whether people would be less willing to engage in corporate social responsibility (CSR) in a firm that emphasizes choice as part of its corporate values, and whether a heightened emphasis on independence mediates the effect of choice on social responsibility. Finally, using cell phone mobility data, Study 5 tested whether in US states in which people are more likely to search the internet for terms related to choice, residents were less likely to follow stay-at-home orders during COVID-19 lockdowns. Across all studies, we report all participants, experimental conditions, and measures. We report the primary analyses without covariates in all studies. All study materials, data, and code related to this article are available on <https://osf.io/ynpdw/>.

Study 1A

In Study 1A, we manipulated the salience of choice by asking some participants but not others to make a single choice as part of the procedure that determined their role in the experiment (10). To assess social responsibility, we used a modified dictator game in which participants had to choose between options that would either benefit themselves more or benefit the group more.

Method

The study was conducted in November 2019. Before commencing data collection, we decided to recruit a total of 60 participants, which would give us 80% power to detect an effect size Cohen's $d = 0.75$. Given that a number of participants who sign up for experiments in our lab do not show up, we opened slots for 70 participants. We decided to stop data collection once all participants who signed up for our study were run. In response, 62 undergraduate students at Nanyang Technological University (20 men and 42 women; $M_{age} = 21.32$ years, $SD = 2.24$) showed up for the experiment. Participants were randomly assigned to either the control condition or the choice condition. All participants were told that they would be assigned to groups of three, and within the group, they would be assigned one of the two roles, *decider* or *receiver*. Each group would have one decider and two receivers.

We adapted the experimental manipulation from past research (10). In the choice condition, participants chose to associate one color (either green or blue) with the decider role; the other color

Table 1. Participants' choices in Studies 1A and 1B.

	Option 1	Option 2	% of participants chose Option 1 (i.e. the self-serving option)			
			Study 1A		Study 1B	
			Control (%)	Choice (%)	Control (%)	Choice (%)
1	The decider can keep 500 points for themselves and give 200 points to each of the two receivers	The decider can keep 400 points for themselves and give 300 points to each of the two receivers	56.25	90.00	67.74	91.18
2	The decider can keep 600 points for themselves and give 300 points to each of the two receivers	The decider can keep 500 points for themselves and give 400 points to each of the two receivers	53.13	86.67	64.52	88.24
3	The decider can keep 700 points for themselves and give 400 points to each of the two receivers	The decider can keep 600 points for themselves and give 500 points to each of the two receivers	50.00	86.67	67.74	82.35
4	The decider can keep 700 points for themselves and give 100 points to each of the two receivers	The decider can keep 400 points for themselves and give 300 points to each of the two receivers	71.88	86.67	64.52	91.18
5	The decider can keep 800 points for themselves and give 200 points to each of the two receivers	The decider can keep 500 points for themselves and give 400 points to each of the two receivers	75.00	96.67	70.97	88.24
6	The decider can keep 900 points for themselves and give 300 points to each of the two receivers	The decider can keep 600 points for themselves and give 500 points to each of the two receivers	56.25	93.33	61.29	85.29

was, thus associated with the receiver role. In the control condition, the computer chose the color associated with the decider role. In both conditions, the computer then placed into an urn one ball of the color associated with the decider role and two balls of the color associated with the receiver role. The computer then randomly picked a ball. Participants were assigned the role associated with the color of the ball picked by the computer. Thus, in the choice condition, participants' choice was factually inconsequential: no matter what color they chose to associate with the decider role, their chance of being assigned to that role was exactly one-third.

All participants were assigned to the decider role. Participants were then asked to make six different choices in the same order about how to divide a sum of money between themselves and the two receivers. In each of the six choices, one option maximized their own payoff (e.g. "The decider can keep 500 points for themselves and give 200 points to each of the two Receivers"), whereas the other option maximized the total payoff (e.g. "The decider can keep 400 points for themselves and give 300 points to each of the two Receivers," see Table 1 for details). Participants were told that the receivers just had to accept whatever the decider gave them. As 62 deciders each made six choices, we had a total of 372 observations.

The experiment was programmed using z-Tree software (16). At the beginning of the experiment, written instructions were distributed and read aloud by the experimenter. At the end of the experiment, all participants were paid according to their decisions (200 points were converted to S\$1, or US\$0.74).

Results

In the control condition, deciders chose the option that maximized their own payoff 60.4% of the times, 95% CI [52.5%, 68.3%], $SD = 0.22$. In the choice condition, this proportion increased to 90.0%, 95% CI [83.0%, 97.0%], $SD = 0.19$ (see Table 1 for trial-by-trial results). A t test using the frequency with which each participant chose the selfish option as the unit of observation indicated that this difference was significant, $t(60) = -5.68$, $P < 0.0001$, Cohen's $d = 1.44$, 95% CI [0.88, 2.00].

In an additional analysis, we assessed whether this finding holds even after controlling for a number of demographic variables. We ran a hierarchical logistic regression with the six trials nested within participants. In each trial, we coded the dependent variable as 1 if participants chose the self-serving option, and 0 otherwise. As predictors, we included experimental condition (0 = control, 1 = choice), trial number (range 1 to 6, mean-centered), and participants' gender (0 = male, 1 = female), age (mean-centered), and major (1 = business or economics, 0 = others). Table 2 reports the regression results. The effect of the experimental condition was significant both with and without covariates. The odds that participants chose the self-serving option are 8.53 times higher in the choice condition than in the control condition (see Model (2)).

Study 1A found that people's likelihood of choosing an option that maximized their own welfare (but reduced the collective welfare) increased by 29.6% (a factor of 49%) in the choice condition compared to the control condition. Viewed differently, whereas

Table 2. Hierarchical logistic regression with proportion of self-serving choices as the dependent variable (Study 1A).

Model 1						
Predictor	Beta	SE	95% CI	z-value	P-value	Odds ratio
Choice	2.05***	0.42	[1.24, 2.87]	4.95	< 0.0001	7.79
Constant	0.48**	0.22	[0.047, 0.92]	2.17	0.03	1.62
Model 2						
Predictor	Beta	SE	95% CI	z-value	P-value	Odds ratio
Choice	2.14***	0.41	[1.35, 2.94]	5.26	< 0.0001	8.53
Trial	0.13	0.08	[-0.025, 0.29]	1.64	0.101	1.14
Age	-0.17**	0.079	[-0.32, -0.013]	-2.12	0.034	0.85
Major	0.006	0.36	[-0.69, 0.70]	0.02	0.99	1.01
Gender	0.36	0.36	[-0.34, 1.06]	1.00	0.32	1.43
Constant	0.20	0.37	[-0.53, 0.92]	0.54	0.59	1.22

Note: number of observations is 372. Number of participants is 62. *** Significant at the 1 percent level, ** Significant at the 5 percent level, and * Significant at the 10 percent level.

participants in the control condition were 1.5 times more likely to choose the self-serving option over the group-serving option, participants in the choice condition were nine times more likely to choose the self-serving option over the group-serving option. Note that the choice made by participants in the choice condition (whether to associate the color blue or the color green with the decider role) was factually inconsequential. However, if the value of independence was more salient in the choice condition (12), then participants in the choice condition might have felt justified to act in their own best interests rather than in the interest of the collective.

Study 1B

The effect size of the choice manipulation found in Study 1A was particularly large, Cohen's $d = 1.44$. For reference, an effect size of $r = 0.40$, equivalent to $d = 0.875$, is considered "very large" (17). Therefore, we sought to conduct a preregistered exact replication of Study 1A.

Method

This study was conducted in March 2020. We preregistered the method and analyses for this study at <https://osf.io/sezpd>. A power analysis based on $d = 1.44$, $\alpha = 0.05$ (one-tailed), and power = 99%, indicated that we would need to recruit 16 participants to each condition. Nevertheless, we predecided to recruit 30 participants for each condition, for a total of 60 participants. Given that some participants who sign up for experiments in our lab do not show up, we opened slots for 70 participants. We decided to stop data collection once all participants who signed up for our study were run. In response, 65 participants showed up (28 men and 37 women; $M_{age} = 22.11$ years, $SD = 2.60$). The procedure was identical to that of Study 1A.

Results

We found that in the control condition, participants chose the option that maximized their own payoff 66.1% of the time, 95% CI [54.5%, 77.8%], $SD = 0.32$. In the choice condition, this proportion increased to 87.7%, 95% CI [80.7%, 94.8%], $SD = 0.20$ (see Table 1 for trial-by-trial results). A t test using the frequency with which each decider chose the selfish option as the unit of observation indicated that this difference was significant, $t(63) = -3.30$, $P = 0.0016$, Cohen's $d = 0.82$, 95% CI [0.31, 1.32]. A hierarchical logistic regression identical to Study 1A found a significant effect of the exper-

imental condition even after controlling for participants' gender, age, and major. The odds that participants chose the self-serving option are 6.93 times higher in the choice condition than in the control condition (see Table 3 Model (2)).

Study 1B provided a direct replication of Study 1A, thereby offering additional evidence for the robustness of our effect. The effect size in Study 1B, $d = 0.82$, was lower than in Study 1A, $d = 1.44$. This difference indicates that the extraordinarily large effect size found in Study 1A was likely an overestimation. Nevertheless, the current more reasonable effect size of $d = 0.82$ is still close to a "very large" threshold (17), and indeed, we found this large effect size in a preregistered experiment. However, the 95% CI of the effect size of choice is quite wide, ranging from $d = 0.31$ to $d = 1.32$, indicating that a larger sample size would be needed to identify the precise effect size. Nevertheless, Studies 1A and 1B together indicate that the salience of choice is a powerful lever that reduces socially responsible behavior.

Study 2A

The findings of Studies 1A and 1B were consistent with our hypothesis that the salience of choice reduces socially responsible behavior. However, the procedure used in this study is not realistic as people rarely get money to just freely distribute between themselves and others. Therefore, to provide a better analogue to real-life interactions, in this experiment, we simulated a seven-person market involving interactions between sellers, buyers, and third parties.

This setup distills the key elements of companies' and individuals' real-life decisions about whether to produce and purchase conventional or socially responsible goods, and thus allows us to study a complex real-life interaction using a simplified yet realistic setup in the lab. For example, sellers need to decide whether to adopt environment-friendly manufacturing procedures, or whether to improve working conditions for factory workers. If sellers produce conventional products, third parties (e.g. factory workers and people living in the polluted environment) would suffer, but the goods produced would be cheaper. If sellers produce socially responsible goods, third parties would not suffer, but the goods produced would be more expensive. Buyers then have to choose whether to purchase the cheaper goods offered by conventional sellers or more expensive goods offered by socially responsible sellers. Overall, if all sellers decide to produce socially responsible goods, buyers will have to pay higher prices,

Table 3. Hierarchical logistic regression with proportion of self-serving choices as the dependent variable (Study 1B).

Model 1						
Predictor	Beta	SE	95% CI	z-value	P-value	Odds ratio
Choice	1.79***	0.55	[0.70, 2.87]	3.22	0.001	5.97
Constant	0.99***	0.37	[0.27, 1.71]	2.70	0.007	2.70
Model 2						
Predictor	Beta	SE	95% CI	z-value	P-value	Odds ratio
Choice	1.94***	0.57	[0.82, 3.05]	3.40	0.001	6.93
Trial	-0.046	0.087	[-0.22, 0.13]	-0.52	0.60	0.96
Age	0.16	0.13	[-0.098, 0.42]	1.22	0.22	1.18
Major	-0.48	0.56	[-1.58, 0.63]	-0.85	0.40	0.62
Gender	-0.14	0.60	[-1.31, 1.04]	-0.23	0.82	0.87
Constant	1.22**	0.48	[0.27, 2.16]	2.53	0.011	3.37

Note: number of observations is 390. Number of participants is 65. *** Significant at the 1 percent level, ** Significant at the 5 percent level, and * Significant at the 10 percent level.

but society as a whole would be better off in the long run (e.g. there will be less pollution) (18).

In markets, everyone is clearly making a series of choices about what to produce or what to buy. Yet, we ask whether making one single choice before the commencement of market interactions shifts the proportion of socially responsible goods that are transacted in the market across a series of repeated interactions. We, thus tested our key hypothesis in a much more elaborate and realistic multiparty interaction setting.

Method

This study was conducted between January and March 2018. We decided to stop data collection once we had run a total of 30 markets, each with seven participants. We recruited a total of 210 Nanyang Technological University undergraduates (85 men and 125 women; $M_{age} = 21.90$ years, $SD = 2.08$) to participate in a lab experiment. Participants were run in groups of seven, each representing a market consisting of three sellers, two buyers, and two third parties. Markets were randomly allocated to either the control condition or the choice condition. We had a total of 30 markets, 15 in each condition. Within each market, participants were randomly assigned to one of the three roles by the computer. Participants transacted in the market over 16 rounds. We, thus had a total of 960 data points at the transaction level (30 markets \times 16 rounds \times 2 potential transactions per round) and 480 data points at the market level (30 markets \times 16 rounds).

Market simulation

Following Bartling et al. (19), we simulated a posted-offer product market. At the beginning of each round, each seller had to decide which of two goods to produce—Type I product (i.e. the socially responsible good) or Type II product (i.e. the conventional good). These goods differed in their production cost and their impact on third parties. The Type I product cost the seller 10 points to produce, whereas the Type II product was free to produce. Sellers could set the price of their product at any value between 0 and 50 points. As the Type I products cost more to produce, it is likely that sellers would price them higher than Type II products.

Once all three sellers decided which product to produce and what price to ask for it, the two buyers entered the market sequentially in random order. Each buyer was given the current menu of sellers' product offers and asked to decide whether they wanted to purchase any of the products available for the posted price. Each buyer could purchase at most one product and could also choose to not make a purchase. Once a product is purchased by the first

buyer, it is no longer available to the second buyer. Both product types are worth 50 points to the buyers, thus generating a surplus of 50 to buyers when exchanged.

In each round, each third party was randomly paired with a buyer. Buyers and third parties were not informed about whom they were paired with. If a buyer purchased a socially responsible good, their associated third party did not incur any loss. However, if a buyer purchased a conventional good, their associated third party would incur a loss of 60 points. Thus, when a conventional good is transacted, society (as defined by all seven people in the market) would incur a net loss of 50 points, compared to when a socially responsible good is transacted.

Choice manipulation

Participants were given an endowment (i.e. a starting asset) in each round that enabled them to participate in the market game (i.e. sellers were given money that they could use to produce a product, and buyers were given money that they could use to buy a product). There were two levels of the endowment: high (100 points) or low (50 points). Similar to Studies 1A and 1B, we manipulated whether or not participants made a nominal choice as part of the random process that determined their endowment (10).

In the choice condition, each seller and buyer could choose to associate one color (either green or blue) with the high endowment; the other color was, thus associated with the low endowment. In the control condition, the computer chose the color associated with the high endowment. For buyers (sellers), the computer would then put one ball (two balls) of the color associated with the high endowment, and one ball of the color associated with the low endowment in an urn, and then randomly pick a ball. If the computer picked a ball associated with the high endowment, participants would receive 100 points; otherwise, they would receive 50 points. Participants received the same endowment in all 16 rounds of the market game. Thus, each buyer had exactly 50% chance of being rich and 50% chance of being poor. Each seller had 66.67% chance of being rich and 33.33% chance of being poor. Note that in both conditions, participants' endowment was determined by a purely random process. Third parties always received 100 points.

The experiment was programmed using the software z-Tree (16). At the beginning of the experiment, the experimenter distributed the instructions to participants and read them aloud. Each participant's final payment included a show-up fee of S\$2 and their earnings from the market game. Their earnings from the market game depended on the points they earned in one ran-

domly selected round of the market game, converted into Singapore dollars at the rate of 10 points = S\$1.

Results

Overall, we had data from decisions of three sellers and purchase decisions of two buyers across 30 markets over 16 rounds, which yielded a total of 1,440 data points for sellers, 960 for buyers, and 480 for market-level outcomes. Of the 960 possible transactions, we had 931 successful transactions (469 in the control condition and 462 in the choice condition) in which a buyer purchased a good offered by a seller. Results about sellers' offers, posted prices, and final transacted prices are reported in Table S1. Our key focus here was on the types of goods that were ultimately transacted in a market, as third parties suffered a loss only if conventional goods were transacted. Further, market outcomes reflect the consequences for society as a whole, and thus are most relevant for public policy.

As expected, the market share of the socially responsible good was smaller in the choice condition, $M = 25.6\%$, 95% CI [11.9%, 39.4%], $SD = 0.25$, than in the control condition, $M = 37.1\%$, 95% CI [22.0%, 52.2%], $SD = 0.27$, Cohen's $d = 0.44$. After participants made a single nominal choice at the beginning of the experiment, the relative share of the socially responsible good dropped by 31% (i.e. [37.1%–25.6%]/37.1%).

To provide a formal test of our hypothesis, we conducted a regression. The level of analysis was the market share of the socially responsible good in each round of each market ($N = 480$). As the same individuals participated in multiple rounds within a given market, we controlled for market fixed effects to account for all unobservable variations across markets. In this way, all time-invariant between-market factors (including participants' gender, age, major, and so on) are automatically controlled for. We included a dummy variable, *Choice*, to reflect the experimental condition (choice condition = 1, control condition = 0). In the base model, we did not include any covariates. As predicted, we found that the market share of the socially responsible good was significantly lower in the choice condition than in the control condition, $B = -0.44$, 95% CI [-0.56, -0.31], $SE = 0.063$, $t(450) = -7.00$, $P < 0.0001$.¹ In the next model, as the pattern of participants' choices is likely to vary over time, we included the round number (range 1 to 16), and an interaction between the choice dummy and round number. The simple effect of the choice condition remained significant, $B = -0.40$, 95% CI [-0.57, -0.24], $SE = 0.086$, $t(448) = -4.71$, $P < 0.0001$. Furthermore, we found a simple effect of round number such that the market share of the socially responsible good tended to decrease across the 16 rounds, $B = -0.0097$, 95% CI [-0.018, -0.0016], $SE = 0.0041$, $t(448) = -2.36$, $P = 0.019$; however, this decline did not vary by condition, as indicated by a non-significant interaction, $B = -0.0039$, 95% CI [-0.015, 0.0068], $SE = 0.0054$, $t(448) = -0.71$, $P = 0.48$.

Table 4 reports the average earnings made by individuals in each role in each condition. Within each condition, the average earnings for buyers and sellers who received a high endowment were around 50 points more than those of buyers and sellers who received a low endowment, suggesting that initial endowment conditions did not affect the gap in final earnings (in the control condition, $P = 0.62$ for sellers and $P = 0.92$ for buyers; in the choice condition, $P = 0.95$ for sellers and $P = 0.58$ for buyers). Compared to the control condition, sellers earned a bit lower, and buyers earned a bit higher in the choice condition. The average total earnings for two buyers and three sellers in a market were around 1.1 points higher in the choice condition compared to the control

Table 4. Average earnings of different roles, by endowment and condition (Study 2A).

		Control	Choice
Seller	Low endowment	$M = 62.50$, 95% CI [58.93, 66.08], $SD = 6.46$	$M = 61.15$, 95% CI [57.88, 64.41], $SD = 5.90$
	High endowment	$M = 111.53$, 95% CI [109.35, 113.72], $SD = 3.95$	$M = 111.03$, 95% CI [108.21, 113.84], $SD = 5.08$
Buyer	Low endowment	$M = 77.31$, 95% CI [74.25, 80.37], $SD = 5.53$	$M = 78.41$, 95% CI [74.39, 82.43], $SD = 7.25$
	High endowment	$M = 127.53$, 95% CI [124.07, 131.00], $SD = 6.26$	$M = 129.88$, 95% CI [126.01, 133.76], $SD = 7.00$
Third party		$M = 63.25$, 95% CI [54.50, 72.00], $SD = 15.80$	$M = 56.50$, 95% CI [48.20, 64.80], $SD = 14.99$

condition. However, the average total earnings of two third parties were 13.5 (i.e. [63.25–56.5] *2) points lower in the choice condition compared to the control condition. The benefit obtained by sellers and buyers in the choice condition was 8.15% of the loss suffered by third parties. To conduct a formal test, we ran parallel regressions to the one described above but with third parties' earnings in each market in each round of each market as the dependent variable. In the base model, we found that third parties' earnings were significantly lower in the choice condition compared to the control condition, $B = -30.00$, 95% CI [-35.38, -24.62], $SE = 2.74$, $t(450) = -10.95$, $P < 0.0001$.² The effect held even after including round number as a covariate, $B = -29.50$, 95% CI [-37.37, -21.63], $SE = 4.01$, $t(448) = -7.37$, $P < 0.0001$. The third parties' earnings declined across the 16 rounds, $B = -0.84$, 95% CI [-1.31, -0.37], $SE = 0.24$, $t(448) = -3.54$, $P < 0.0001$, but this decline did not vary by condition, $B = -0.059$, 95% CI [-0.69, 0.57], $SE = 0.32$, $t(448) = -0.18$, $P = 0.85$.

These results seem like a paradox: sellers did not obtain any benefits, and buyers only obtained marginal benefits from switching from socially responsible goods to conventional goods in the choice condition; however, third parties suffered a big loss as a result of the increased transaction of conventional goods in the choice condition. But in fact, these findings are not surprising because the cost savings for producing conventional goods (10 points) was dwarfed by the losses imposed on third parties by conventional goods (60 points).

Study 2A found that asking people to make a single factually inconsequential choice at the beginning of an experimental market reduced the market share of socially responsible goods by 11.5% (a factor of 31%). These findings are striking because the choice that participants made was factually inconsequential, and could not have influenced their outcome in any way possible. However, the cost borne by third parties was real and salient—indeed, the third parties were in the same room as both buyers and sellers. The switch from socially responsible to conventional goods in the choice condition did not yield any measurable benefits for buyers and sellers; however, it imposed a significant cost on third parties and reduced the overall societal welfare.

Study 2B

The goal of Study 2B was to conceptually replicate the findings of Study 2A using a different experimental manipulation of choice.

Specifically, Study 2A implemented the choice manipulation with respect to whether participants received a high or a low endowment. In Study 2B, we asked whether the salience of choice would have a similar effect when it is implemented in another context that eliminated the wealth inequality. Specifically, in this study, we gave all participants an identical endowment but varied whether they made a nominal choice in the process that determined their role in the market.

Method

This study was conducted between April and August 2018. As in Study 2A, we decided to stop running participants once we had run a total of 30 markets. We recruited a total of 210 Nanyang Technological University undergraduates (97 men and 113 women; $M_{age} = 22.07$ years, $SD = 1.76$) to participate in a lab experiment. The experimental setup was identical to that of Study 2A but with two changes. First, we gave all market participants (buyers, sellers, and third parties) an endowment of 100 points in each round. Second, we manipulated nominal choice in the process that determined participants' role in the experiment, that is, whether they were a buyer, a seller, or a third party.

Choice manipulation

In the choice condition, each participant was asked to associate one of three colors (i.e. green, blue, or yellow) with each of the three roles (i.e. seller, buyer, and third party). In the control condition, the computer associated one of three colors with each of the three roles. Thereafter, in both conditions, the computer randomly selected one color, which determined the participant's role in the market. In each seven-person market, the computer was programmed to select three sellers, two buyers, and two third parties. The rest of the procedure was identical to that in Study 2A.

Results

As in Study 2A, we had 15 independent markets in each of the two conditions. Of the 960 possible transactions, we had 924 successful transactions (461 in the control condition and 463 in the choice condition) in which a buyer purchased a good offered by a seller. Results about sellers' offers, posted prices, and final transacted prices are reported in Table S2.

The market share of the socially responsible good was significantly smaller in the choice condition, $M = 27.9\%$, 95% CI [15.6%, 40.2%], $SD = 0.22$, than in the control condition, $M = 43.3\%$, 95% CI [27.2%, 59.4%], $SD = 0.29$, Cohen's $d = 0.59$. After participants made a single nominal choice at the beginning of the experiment, the relative share of the socially responsible good dropped by 36% (i.e. [43.3%–27.9%]/43.3%). We conducted a similar regression as that used in Study 2A. In the base model, we did not include any covariates. We found that the market share of the socially responsible good was significantly lower in the choice condition than in the control condition, $B = -0.43$, 95% CI [-0.64, -0.22], $SE = 0.11$, $t(449) = -4.03$, $P < 0.0001$.³ In the next model, we included the round number (range 1 to 16), and an interaction between the choice dummy and round number. The simple effect of the choice condition remained significant, $B = -0.37$, 95% CI [-0.60, -0.14], $SE = 0.12$, $t(447) = -3.12$, $P = 0.002$. Furthermore, we found the market share of the socially responsible good did not vary across the 16 rounds, $B = 0.0041$, 95% CI [-0.004, 0.012], $SE = 0.0041$, $t(447) = 0.99$, $P = 0.32$, and the time trend did not vary by condition,

Table 5. Average earnings of different roles, by condition (Study 2B).

	Control	Choice
Seller	$M = 110.87$, 95% CI [108.82, 112.92], $SD = 3.70$	$M = 110.54$, 95% CI [108.05, 113.02], $SD = 4.48$
Buyer	$M = 127.49$, 95% CI [124.92, 130.05], $SD = 4.63$	$M = 129.65$, 95% CI [126.18, 133.13], $SD = 6.27$
Third party	$M = 67.75$, 95% CI [58.12, 77.38], $SD = 17.39$	$M = 58.75$, 95% CI [51.47, 66.03], $SD = 13.14$

as indicated by a nonsignificant interaction, $B = -0.0077$, 95% CI [-0.019, 0.0034], $SE = 0.0056$, $t(447) = -1.37$, $P = 0.17$.

Table 5 reports the average earnings made by individuals in each role in each condition. Sellers earned similar profits in the two conditions, and buyers earned slightly higher in the choice condition. The total earnings of all buyers and sellers in a market were 3.33 points higher in the choice condition compared to the control condition. However, the total earnings of third parties were 18 points lower in the choice condition. The benefit obtained by sellers and buyers in the choice condition was 18.5% of the loss suffered by third parties. To conduct a formal test, we ran parallel regressions as in Study 2A with third parties' earnings in each round of each market as the dependent variable. In the base model, we found that the earnings of the third parties were significantly lower in the choice condition compared to the control condition, $B = -30.00$, 95% CI [-42.03, -17.97], $SE = 6.12$, $t(450) = -4.90$, $P < 0.0001$.⁴ The effect held even after including round number as a covariate, $B = -28.55$, 95% CI [-42.20, -14.90], $SE = 6.94$, $t(448) = -4.11$, $P < 0.0001$. The third parties' earnings did not vary across the 16 rounds, $B = -0.047$, 95% CI [-0.49, 0.40], $SE = 0.23$, $t(448) = -0.21$, $P = 0.84$, and the time trend did not vary by condition, $B = -0.17$, 95% CI [-0.80, 0.46], $SE = 0.32$, $t(448) = -0.53$, $P = 0.59$.

Once again, increasing the salience of choice reduced the proportion of socially responsible goods transacted in the market by one-third. Further, the resulting additional costs borne by third parties dwarfed the gains made by buyers and sellers. The finding is striking given that one choice that had no potential at all to influence individuals' outcomes had such a large effect on market transactions.

Study 3

Studies 1A to 2B tested our hypothesis using behavioral economics paradigms in the lab. These paradigms were powerful because they were incentive-compatible and featured interaction partners who were physically present in the same room. The goal of Study 3 was to test our hypothesis that the salience of choice reduces socially responsible behavior in the context of COVID-19. During early phases of the pandemic, essential supplies such as masks and hand sanitizers were in shortage. Socially responsible behavior would mean purchasing only what is needed rather than hoarding these essential supplies. Further, when social distancing guidelines are in place, being socially responsible means staying indoors and leaving one's home only for essential needs, such as purchasing food or medicines. In this study, we tested whether framing hoarding and social distancing behaviors in terms of choice would reduce socially responsible behavior.

Method

This study was conducted in April 2020, when many parts of the United States were in a COVID-19 lockdown. We conducted a power analysis based on effect size Cohen's $d = 0.44$ (from Study 2A, the lowest effect size in Studies 1A to 2B), $\alpha = 0.05$ (two-tailed), and power = 95%, which indicated that we need to recruit 272 participants. Our stopping rule was to cease running participants once the surveys were marked as complete on the online data collection platform. We posted two successive surveys seeking a total of 280 US residents on Amazon's Mechanical Turk (MTurk).⁵ In response, 308 participants completed the survey. We first excluded 20 responses from duplicate IP addresses, and then 20 participants who provided gibberish or irrelevant responses to the open-ended question asked at the end of this study (see data file uploaded on OSF for responses marked gibberish). We were, thus left with 268 participants (124 women, 123 men, 1 other, and 20 unreported; $M_{age} = 36.92$ years, $SD = 12.24$, 19 unreported) in the dataset. Participants were randomly assigned to either the control condition or the choice condition.

Choice to hoard

Participants were told to imagine their region is in a lockdown because of the ongoing COVID-19 pandemic. In both conditions, participants were asked whether they would buy more than one bottle of hand sanitizer at a supermarket; buy the last available roll of toilet paper even though they have sufficient toilet paper at home; go for a walk despite social distancing guidelines, and go to the supermarket to buy food even though they have a sore throat (see survey uploaded on OSF for verbatim materials). For example, in the control condition, participants were asked, "How likely would you be to buy the last pack of toilet paper in the supermarket?" In the choice condition, we added the word "choose" to this question: "How likely would you be to choose to buy the last pack of toilet paper in the supermarket?" Participants responded on a 5-point scale ranging from "very unlikely" to "very likely" ($\alpha = 0.50$). Thereafter, we asked participants: "Please summarize the main point of the statements that you just responded to in this survey."

Results

A t test revealed that participants were less likely to act in a socially responsible manner in the choice condition ($M = 3.24$, 95% CI [3.10, 3.39], $SD = 0.87$) than those in the control condition ($M = 2.96$, 95% CI [2.82, 3.10], $SD = 0.79$), $t(266) = -2.80$, $P = 0.0054$; Cohen's $d = 0.34$, 95% CI [0.10, 0.58].

Study 3 found that the salience of choice can reduce socially responsible behavior in the context of a pandemic. When merely exposed to the word "choice," participants were more willing to engage in hoarding and violating social distancing rules. This finding indicates that the results of Studies 1A to 2B generalize to important real-world contexts.

Study 4

The goal of Study 4 was to conceptually replicate the previous findings with a large sample preregistered study. We also tested whether an increased emphasis on independence would mediate the effect of choice on social responsibility.

Method

This study was conducted in February 2022. The hypotheses, power analysis, method, sample size, and exclusion criteria for

this study were preregistered at <https://osf.io/kwtfs>. A pilot study using the same materials found an effect in the predicted direction with Cohen's $d = 0.30$. A power analysis with $d = 0.30$, $\alpha = 0.05$ (one-tailed), and power = 99.5% indicated that we need to recruit 794 participants to detect a significant difference across conditions in a between-participants design. Rounding up this number, we posted four successive surveys seeking a total of 800 US residents on MTurk. Our stopping rule was to cease running participants once the four surveys were marked complete on MTurk. In response, 802 participants completed the survey. As preregistered, we first excluded six responses from duplicate IP addresses, and then 95 participants who provided gibberish or irrelevant responses to the open-ended question at the end of this study (see data file uploaded on OSF for responses marked gibberish⁶). We were, thus left with 701 valid participants (356 women, 337 men, 5 others, and 3 unreported; $M_{age} = 42.73$ years, $SD = 12.40$, 18 unreported).

Participants were asked to imagine that they were the CEO of a large international mining company that has been the target of protests by environmentalists. Although the company had followed all government regulations, to counteract the criticism, the company's board of directors had recommended engaging in costly CSR measures. Participants had to decide whether to undertake the CSR measures recommended.

In the choice condition, we presented one sentence emphasizing choice on the survey page where we measured participants' sense of independence: "As the CEO of a for-profit company, you believe that companies' freedom of choice should not be restricted." In the control condition, we merely stated, "As the CEO of a for-profit company. . ." (see survey uploaded on OSF for verbatim materials). We used three items to measure the independence mediator based on the defining features of independence-interdependence: expressing oneself and acting on one's internal attributes (e.g. beliefs and convictions) vs. adjusting to others and maintaining harmony (20). Specifically, in both conditions, participants were asked: (1) "How likely are you to make changes to allay environmentalists' criticisms even though you disagree with them?" (2) "How likely are you to defer to the board of directors' decisions to maintain harmony with environmentalists when making decisions, even if you disagree with them?" (3) "How likely are you to change your mind about a decision that you believe is correct in the face of external pressures?" Participants responded on a 7-point scale ranging from "extremely unlikely" to "extremely likely." We averaged the three items to form a measure of emphasis on independence ($\alpha = 0.84$).

We used three items to measure CSR based on Carroll's Pyramid model (21, 22). In both conditions, participants were asked whether they would agree to donate 2% of the company's revenues (1) to the people who live near your mines; (2) to a foundation that would fund the social good; and (3) to protect animals who live in the area near your mines. In the choice condition, after each item, we added: "As you are the CEO, it's your choice!" In the control condition, we did not add any additional statement. Participants responded on a scale ranging from "0 (definitely not donate)" to "100 (definitely donate)." We averaged the three items to form the dependent variable ($\alpha = 0.83$). Thereafter, we asked participants an open-ended question: "Please briefly explain what the scenario that you just responded to was about."

Results

Participants emphasized independence more in the choice condition ($M = 4.17$, 95% CI [4.03, 4.31], $SD = 1.32$) than in the control

condition ($M = 4.56$, 95% CI [4.43, 4.70], $SD = 1.26$), $t(699) = 4.02$, $P = 0.0001$; Cohen's $d = 0.30$, 95% CI [0.15, 0.45]. Additionally, participants were less likely to engage in CSR measures in the choice condition ($M = 53.34$, 95% CI [50.27, 56.42], $SD = 29.15$) than in the control condition ($M = 58.87$, 95% CI [56.07, 61.67], $SD = 26.71$), $t(699) = 2.62$, $P = 0.0045$ (one-tailed, as we preregistered a directional hypothesis), $P = 0.009$ (two-tailed); Cohen's $d = 0.20$, 95% CI [0.049, 0.35]. To test whether the emphasis on independence mediated the effect of the choice manipulation on CSR, we used Hayes' PROCESS macro (23) with 5000 bootstrapped iterations. The mediation analysis revealed that the between-condition difference in social responsibility was mediated by the between-condition difference in independence (indirect effect = -4.84 , 95% CI = $[-7.44, -2.52]$).

Study 4 conceptually replicated the key finding of the previous studies using a large sample preregistered study. Further, Study 4 provided evidence for the underlying mediator—a greater emphasis on independence in the choice condition. The effect size of the choice manipulation on CSR was small compared to other studies, but this was not surprising because the choice manipulation was subtle—merely presenting participants with two sentences. Additionally, the mediator intervened between the experimental manipulation and the dependent measure, and thus likely weakened the effect of the manipulation and the dependent measure. Indeed, the effect size of the manipulation on the mediator was around 50% larger than that of the manipulation on the dependent variable.

Study 5

The goal of Study 5 was to provide an additional test of our key hypothesis using real-world behavior. Specifically, we tested whether in US states in which residents are more likely to search for choice-related terms on the internet, residents are also less likely to follow government-issued stay-at-home orders.

Extensive research in social psychology has found that the concept of choice is more salient in some cultural contexts than in others. For example, Americans value choice more than South Asians—they are more upset than South Asians when their choice is usurped or pre-empted (24). Americans are more likely than South Asians to perceive their own and others' actions through a lens of choice (7). Additionally, Americans are less likely than South Asians to accommodate others' wishes (25) and to adjust their choices away from their preferences and toward the expectations of salient others (26), indicating that they value personal choice more than interpersonal relationships. Americans' choices are also less influenced by social norms than South Asians' choices (27). The emphasis on choice also varies by social class. People in more formally educated and more middle-class contexts value choice more than those in less formally educated and working-class contexts (28, 29). There are also regional differences within the United States in related constructs (30). US counties differ in ethnic composition, education, occupation, income, conservatism, urban-rural divide, and so on. As many of these factors have been associated with differential emphases on choice, there is reason to expect regional variation in the salience of choice.

We propose that in communities in which the idea of choice is more salient in everyday life, people would be more likely to use choice-related words in their everyday communication and usage. Indeed, the frequency with which residents of a state search for "God" on Google explains 65% of the variation in religiosity across states, and the frequency with which residents of a state search

for "gun" explains 62% of the variation in gun ownership across states (31). If the salience of choice simultaneously makes people less socially responsible, then communities in which people use the language of choice more often are also likely to be less socially responsible during lockdowns. Thus, we reasoned that the salience of choice is the latent variable that is simultaneously expressed in the frequency with which people use choice-related terms on Google and in the extent to which people comply with COVID-19 lockdown orders.

Compliance with government-issued stay-at-home-order

We used the data provided by SafeGraph Inc. to measure the extent to which people complied with government-issued stay-at-home-order during the COVID-19 pandemic⁷. The data was generated from anonymous mobile devices' location information. Based on a device's geolocation throughout the day, SafeGraph determined whether or not a given device had left its home that day. The data was aggregated at the level of census block groups. We used data from 2020 January 21, the date of earliest recorded confirmed cases, until 2020 April 24, the latest date available at the time of our analysis.

We first computed the percentage of devices that were at home the entire day for a given census block group on a given day. It was calculated by dividing the number of devices that were at home in a census block group the entire day by all devices in that census block group that day. We then aggregated the data at the county level by averaging all census blocks within a county on a given day.

Salience of choice

To obtain an indicator for the salience of choice, we used Google Trends to obtain the frequency with which residents of a state searched terms related to choice on www.google.com in 2019. We used the choice lexicon employed in previous research (12) (see Supplementary Information for the 16 choice-related terms used). The data was accessed on 2022 August 12. We searched each choice-related term on the Google Trends website (<https://trends.google.com>) with the criteria: "United States," "2019," "all categories," and "web search." For each search term, the website provided the subregion index showing the popularity of the search term in each state. The website also provided the top related queries within the respective boundaries. For example, upon searching for "choice" in the United States in 2019, the top five related queries were *choice*, *choice hotels*, *first choice*, *best choice*, and *my choice*. Although *choice hotels* is less relevant to our construct of interest, the remaining four terms appear valid indicators of the salience of choice. As different words are searched with different frequencies on Google.com, we first normalized the subregion index for each choice-related word across all states (range 0 to 100 after normalization), and then averaged the normalized value across all words.

Other variables

We included a dummy variable (SAHO) to indicate whether stay-at-home order was in effect on a given date in a state. If a stay-at-home order went into effect after 8:01 AM on a given date, we treated the next day as the first day on which a stay-at-home order was active. The data was collected until 2020 April 24. The data was obtained from The New York Times (32). We also included the cumulative number of deaths in each state, obtained from The New York Times (33), as a control variable; we did so because the

more COVID-related deaths in a state, the greater the likelihood that people would restrict their movement. The earliest recorded confirmed cases and deaths are from 2020 January 21, and varies across states and counties. We expected that a greater number of deaths would encourage more compliance with stay-at-home orders. In addition, we included several state-level control variables, including median household income, population density, % of people with a bachelor's degree (or higher), and % of the population who identify as non-White (these variables were obtained for the year 2018 from the US Census Bureau (34)). We also included the % of residents identifying with the Republican party in 2018, obtained from Gallup Inc. (35).

Method

We adopted a difference-in-differences approach (36). Specifically, we used a regression specification that exploits the precise timing of stay-at-home orders in each county as follows:

$$\begin{aligned} \%StayHome_{ist} = & \alpha + \beta_1 \times SAHO_{st} + \beta_2 Choice_s \times SAHO_{st} \\ & + \beta_3 Controls_s + \beta_4 Controls_s \times SAHO_{st} + \gamma_1 \\ & + \delta_t + \varepsilon_{ist}. \end{aligned}$$

Here, $\%StayHome_{ist}$ denotes the percentage of devices that were at home the entire day for county i of state s on date t . β_2 captures the marginal response to stay-at-home orders based on the frequency with which people in state s searched choice-related words on Google. The coefficient γ_1 is a vector of county-level fixed effects intended to capture all time-invariant baseline county differences in how often people leave their homes. Control variables include cumulative COVID-related deaths and socio-demographic variables (e.g. political affiliation, income, and population density). All county- and state-level time-invariant variables are omitted in the regression because our county fixed effects already account for all time-invariant county- and state-level variables. We also include date fixed effects in the regression to control for factors varying over time across all counties, such as the national news about COVID-19 on a given date. To test for stationarity, we ran the unit roots test using the Im–Pesaran–Shin (2003) method with panel means included and the time trend excluded (37). The null hypotheses that all panels contain unit roots is rejected, $P < 0.0001$. As we had observations for multiple dates within each county, we tested for serial correlation in the error term (38, 39) and found that the null hypothesis that no first-order autocorrelation exists is rejected, $P < 0.0001$. We, thus clustered SEs at the county level to account for any within-county correlation among the observations (36, 38).

For ease of interpretation, we normalized all independent variables (except the dummy variable) to a mean of 0 and a standard deviation of 1. This means that all regression coefficients can be interpreted as standardized betas. The means and SDs of the original variables are reported in Table S3. Our analyses were carried out at the County \times Date level. In total, we have an unbalanced dataset of 3,235 counties \times 95 days (as different states reported the first case and death on different dates). As we used an unbalanced dataset, we tested for sample selection bias by adding the lagged selection indicator as a predictor in our regression model (38). The coefficient of the lagged indicator was not significant ($B = 0.14$, 95% CI $[-0.022, 0.30]$, $SE = 0.082$, $t(3234) = 1.69$, $P = 0.092$), which indicates that the selection of data in the previous period was not a significant predictor of the outcome variable in the current period. We estimated the model with a fixed effects linear regression (40).

Results

Table 6 reports the regression results. The dependent variable was the percentage of residents staying home the whole day. Model (1) did not include any control variables whereas Model (2) included them. Specifically, Model (2) assessed the effect of stay-at-home orders after controlling for states' education attainment, population density, proportion of ethnic minorities, and identification with the Republican party. Importantly, the coefficient of the interaction term between Choice and StayOrder was negative and statistically significant in both Models (1) and (2), indicating that in states in which the idea of choice was more salient, stay-at-home orders had a weaker effect on the proportion of people leaving their home on a given day, after accounting for all other time-invariant county- or state-level variables. To ensure that our effect was not driven by just a few choice-related words, Models (3) to (12) report regression results in which we excluded the top five choice-related words one at a time; our key result are largely consistent across these models.

The findings of Study 5 are consistent with the results of Study 3, which found that increasing the salience of choice reduced socially responsible behavior in the context of COVID-19. Importantly though, Study 5 is correlational, and thus cannot provide causal evidence. Although we took numerous steps to eliminate potential confounds, there is always room for endogeneity and nonobserved third variables, as with any correlational study.

Discussion

A total of seven studies found that the salience of choice reduced socially responsible behavior. Studies 1A and 1B found that compared to people who did not make any choice, those who made a single factually inconsequential choice as part of the process that determined their role in an economic game (i.e. decider or receiver) were about 41% more likely to choose monetary options that maximized their own payoff while minimizing the payoff of the group that they were part of. Studies 2A and 2B found that compared to experimental markets in which buyers and sellers did not make any choices, in markets in which buyers and sellers made a single factually inconsequential choice before commencing the market interactions, the share of socially responsible goods being transacted dropped by a third. Study 3 found that framing hoarding and violations of social distancing guidelines as choices increased people's willingness to engage in these selfish behaviors. Study 4 conceptually replicated this finding in the context of CSR, and documented that the emphasis on independence mediates the effect of choice on social responsibility. Finally, Study 5 found that in states in which people were more likely to search choice-related terms on the internet, residents were less likely to follow government-issued stay-at-home orders in the context of COVID-19. Importantly, we found conceptually similar findings in Singapore, a relatively more collectivistic country, and the United States, a relatively more individualistic country (41).

In Studies 1A and 2B, one might wonder why the initial choice before the dictator game or the market game ended up influencing participants' decisions, but not their choices during the game (e.g. deciding how to allocate funds across six rounds in Studies 1A and 1B, or deciding which products to purchase across 16 rounds in Studies 2A and 2B). As they make repeated choices in the game, one might expect participants across the choice condition and the control condition to converge toward being similarly selfish. We submit that there is a key distinction between choices that can

Table 6. Fixed-effects linear regressions on the proportion of people staying at home.

Predictor	(1)	(2)	(3)	(4)	(5)	(6) %StayHome	(7)	(8)	(9)	(10)	(11)	(12)
SAHO	2.085*** (0.094)	0.643** (0.310)	2.093*** (0.095)	0.636** (0.310)	2.083*** (0.094)	0.612** (0.310)	2.071*** (0.094)	0.630** (0.310)	2.071*** (0.094)	0.634** (0.310)	2.075*** (0.094)	0.650** (0.310)
Choice × SAHO	-0.158** (0.078)	-0.342*** (0.079)	-0.349*** (0.071)	-0.372*** (0.073)	-0.161** (0.070)	-0.348*** (0.071)	0.031 (0.080)	-0.367*** (0.082)	0.023 (0.075)	-0.311*** (0.079)	-0.039 (0.079)	-0.408*** (0.083)
Cumulative number of deaths		8.652*** (2.005)		8.649*** (2.005)		8.860*** (2.006)		8.719*** (2.004)		8.735*** (2.004)		8.595*** (2.005)
Cumulative number of deaths × SAHO		-8.514*** (1.999)		-8.514*** (1.999)		-8.724*** (2.000)		-8.582*** (1.998)		-8.591*** (1.998)		-8.457*** (1.999)
%Bachelor's degree or higher × SAHO		0.526*** (0.090)		0.479*** (0.085)		0.531*** (0.089)		0.555*** (0.092)		0.553*** (0.095)		0.559*** (0.092)
Median Household Income × SAHO		-0.051 (0.067)		-0.035 (0.067)		-0.083 (0.067)		-0.043 (0.067)		-0.071 (0.067)		-0.038 (0.067)
Population density × SAHO		0.756*** (0.118)		0.780*** (0.119)		0.769*** (0.118)		0.769*** (0.118)		0.760*** (0.118)		0.754*** (0.118)
%Minority × SAHO		-0.254*** (0.071)		-0.211*** (0.074)		-0.279*** (0.071)		-0.288*** (0.070)		-0.302*** (0.071)		-0.213*** (0.072)
%Identification with Republican party × SAHO		-0.469*** (0.128)		-0.433*** (0.128)		-0.461*** (0.128)		-0.502*** (0.126)		-0.474*** (0.129)		-0.495*** (0.126)
Constant	18.374*** (0.580)	20.489*** (0.610)	18.384*** (0.582)	20.496*** (0.610)	18.377*** (0.580)	20.549*** (0.611)	18.440*** (0.579)	20.487*** (0.610)	18.438*** (0.578)	20.498*** (0.610)	18.412*** (0.580)	20.467*** (0.610)
Observations	179,616	179,616	179,616	179,616	179,616	179,616	179,616	179,616	179,616	179,616	179,616	179,616
R-squared	0.731	0.738	0.731	0.738	0.731	0.738	0.731	0.738	0.731	0.738	0.731	0.738
Number of county	3,235	3,235	3,235	3,235	3,235	3,235	3,235	3,235	3,235	3,235	3,235	3,235
County FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Date FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Note: Robust SEs clustered at the county level in parentheses. Models (3) and (4) remove the most frequent word "options." Models (5) and (6) remove the 2nd most frequent word "choose." Models (7) and (8) remove the 3rd most frequent word "chosen." Models (9) and (10) remove the 4th most frequent word "chose." Models (11) and (12) remove the 5th most frequent word "picked." *** Significant at the 1 percent level, ** Significant at the 5 percent level, and * Significant at the 10 percent level.

make it easier for people to justify selfish behavior vs. those that do not do so.

Participants' choice at the very beginning of the experiment was factually inconsequential, but it was tied to a consequential outcome. For example, in Studies 1A, 1B, and 2B, participants in the choice condition made a choice as part of the process that determined their role in the game, and in Study 2A, their endowment. Past research using similar manipulations has verified that participants indeed perceive such choices as inconsequential (10). However, such inconsequential choices can make people feel that they are independent agents (e.g. "I am free to do what I like"). Subsequent choices in the game (e.g. how to allocate money, which product to buy) do not allow participants to make a similar justification, and thus, did not have any impact.

An examination of the effect size across different studies indicates substantial variation. In particular, we obtained very large effect sizes in Studies 1A and 1B, Cohen's $d > 0.80$, but moderate effect sizes in the remaining studies, Cohen's $d \sim 0.30$. A possible explanation for the large variation in effect sizes across studies is that the very large effect sizes observed in some studies were likely an overestimation (although our preregistered exact replications also obtained a very large effect size). Our studies using large sample sizes observed smaller effects, but they also used very different experimental designs. In other words, sample size and effect size were negatively correlated across studies, but this relationship was confounded by study design. If we rely on only the large sample studies, then an effect size estimate of around one-third of a standard deviation (i.e. Cohen's $d = 0.30$) appears to be the most reliable benchmark for the true effect of choice on social responsibility.

This variation in effect sizes also suggests that multiple mechanisms might be at play in Studies 1A and 1B, which found very large effect sizes (Cohen's $d > 0.80$), compared to other studies, which found moderate effect sizes (Cohen's $d \sim 0.30$). Future research can follow up on this paradigm to investigate whether constructs other than independence might be activated by choice in the dictator game context. Additionally, participants self-reported the mechanism that we measured in Study 4—*independence*. However, it is possible that other mechanisms might operate at a nonconscious level and thus might be difficult to tap with self-reported measures. Future research can seek to uncover other conscious and nonconscious mechanisms underlying the effects of choice on social responsibility.

A clear implication of the current findings is that we should not highlight individual choice when promoting the welfare of others or asking people to engage in behavior change for the collective good. However, what should we do instead? One possibility is to build on social identity theory by highlighting in-group identity (42). That is, could highlighting participants' shared in-group identity (e.g. as university students) in the lab experiments (Studies 1A and 2B) negate the deleterious effect of the choice mindset on socially responsible behavior? Just as the mechanisms underlying the effects of minimal group assignment are often nonconscious, it is possible that the effects of a choice mindset are also often nonconscious. Future research can also examine whether highlighting the lack of choice can motivate social responsibility. For example, we can inform people that they do not really have a choice to ignore climate change—*society*, as we know, would not be able to exist if the temperature exceeds a certain threshold. Alternatively, instead of focusing people on the choices they or others have, we can focus them on the constraints that they or others face (43). Or instead of nudging people to construe actions as choices, we can nudge them to construe actions as events (44).

Future research can examine these options to reverse the effect of choice on social responsibility.

Our findings raise a number of theoretical and practical questions. Given that increasing choice is a necessary component of economic growth, how can societies frame choice to promote social responsibility? How can societies balance individual freedom (more choice) and social responsibility (probably less choice), given the many pressing problems that humanity is facing at a global level? The current findings suggest that all else being equal, the increasing practice of choice in nearly all societies can negatively affect social responsibility if it makes the concept of choice chronically salient in people's minds.

Notes

1. The overall model F statistic was missing in the base model without any within-market predictors. Thus, the results from this model need to be interpreted with caution.
2. The overall model F statistic was missing in the base model without any within-market predictors. Thus, the results from this model need to be interpreted with caution.
3. The overall model F statistic was missing in the base model without any within-market predictors. Thus, the results from this model need to be interpreted with caution.
4. The overall model F statistic was missing in the base model without any within-market predictors. Thus, the results from this model need to be interpreted with caution.
5. Our lab has a rule of not posting surveys seeking more than 200 participants on MTurk at a time because in our experience, data quality tends to worsen after about 200 participants. Thus, all MTurk studies requiring more than 200 participants are posted in multiple batches.
6. We marked three types of responses as gibberish: (1) responses that were completely unrelated to the scenario; (2) responses that were not based on the scenario but instead expressed participants' personal opinions; and (3) responses that indicated a clear misunderstanding of the information presented in the scenario.
7. SafeGraph, a data company that aggregates anonymized location data from numerous applications in order to provide insights about physical places, via the SafeGraph Community. To enhance privacy, SafeGraph excludes census block group information if fewer than five devices visited an establishment in a month from a given census block group. SafeGraph allowed researchers to freely download the social distancing metrics during the peak of the COVID-19 pandemic (see <https://docs.safegraph.com/docs/social-distancing-metrics>). We downloaded the data on 2020 April 29.

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Supplementary Material

Supplementary material is available at [PNAS Nexus](#) online.

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Authors' Contributions

Both authors conceptualized the idea; Y.W. designed the study, collected data, and analyzed data; both authors wrote the paper and approved the final submission.

Data Availability

All the data used in the analyses are available at <https://osf.io/npdw/>.

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