# Are Anti-Vaxxers Anti-Social? Pro-Social Behavior and Compliance with Socially Beneficial Policies*

Amnon Maltz† Moti Michaeli‡ Sapir Gavriel §

February 18, 2026

**Abstract**

Governments frequently promote socially desirable behavior through regulation or pressure, particularly during times of crisis. Using vaccination during the Covid-19 pandemic as a case study, we examine how compliance with such policies relates to pro-sociality. As the pandemic entered its final stages, we experimentally measured pro-sociality among a large representative sample in Israel. We find that non-vaxxers exhibit higher levels of pro-sociality than vaxxers, challenging the common association between compliance and pro-social concerns. Looking more closely, we uncover a pattern that we term a "truncated U-shape:" non-vaccinated individuals display the highest pro-sociality, partially vaccinated the lowest, and fully vaccinated fall in between. We explore, and eventually rule out, a wide range of potential explanations, beginning with socio-demographic and attitudinal covariates and extending to the role of social norms. We consequently propose that variation in individuals' ability to abide by their principles in the face of difficulty may account for the observed patterns. Utilizing the richness of our data, we test this channel and find evidence in its favor. Finally, we illustrate this mechanism through a formal model in which individuals differ in their ability to abide by their principles and must decide whether to vaccinate, abstain, or take a compromise action of partial vaccination. In this framework, societal stigma alongside governmental and workplace pressures associated with non-vaccination generate the behavioral patterns we document.

*Keywords: Pro-social behavior, Compliance, Institutional and social pressure, Behavioral decision-making, Experiment, Covid-19 vaccination.*
*JEL Codes: D63, C91, I12*

---

*We would like to thank Mariana Blanco, Alexander Cappelen, Nisvan Erkal, Urs Fischbacher, Ori Heffetz, Joshua Miller, Pietro Ortoleva, Siqi Pan, Marco Piovesan, Simone Quercia, Maria Recalde, Petros Sekeris, Agnieszka Tymula, Tom Wilkening and Ro'i Zultan for helpful comments and discussions.

†University of Haifa, Department of Economics, amaltz@econ.haifa.ac.il
‡University of Haifa, Department of Economics, motimich@econ.haifa.ac.il
§University of Haifa, Department of Economics, sapirgavriel4@gmail.com

# 1 Introduction

During the Covid-19 pandemic, vaccination was widely perceived as a pro-social act, with vaccinated individuals contributing to public health by slowing down the spread of the virus and thereby protecting others from infection. On the flip side, those who remained non-vaccinated were often portrayed as lacking concern for society. Following these views, it seems natural to expect individual measures of pro-sociality to increase with the number of vaccinations against Covid-19. In this paper, however, we show that those who remained non-vaccinated by the end of the pandemic exhibit **higher** pro-sociality than those who did vaccinate. A closer look reveals that the relationship between pro-sociality and the number of vaccinations is, in fact, non-monotonic, with the lowest levels observed among those who were only partially vaccinated. We explore several possible explanations for these patterns, considering the role of different covariates and social norms. Our leading explanation highlights individuals' ability to abide by their principles as the key factor driving the observed patterns. While our study focuses on the relationship between Covid-19 vaccination and pro-sociality, the findings speak more broadly to environments in which governments or organizations promote socially desirable behavior through regulation or pressure. When individuals' views regarding the policy are heterogeneous, observed non-compliance need not signal low pro-sociality.

In October 2022, as the Covid-19 pandemic was winding down, we sent two separate online questionnaires to a large representative sample of the Israeli adult population. In the first questionnaire, we collected information regarding the number of vaccinations against Covid-19, number of infections with the disease and reasons for vaccinating or for not doing so. In the second questionnaire, sent out roughly ten days after the first and structured without any reference to the earlier questionnaire (making it practically impossible for participants to link the two), participants were asked to play the Dictator Game (DG) and the Trust Game (TG) in both roles. From these tasks we derived three measures of pro-sociality: altruism (the share given in the DG), trust (the share transferred as player A in the TG), and trustworthiness (the share returned as player B in the TG).

A total of 1992 participants completed the first questionnaire, with 1562 following up and completing the second. Among them, some were non-vaccinated, most were fully vaccinated with at least three doses (the third being a booster), and the remainder received one or two doses and are therefore considered partially vaccinated. We find that the non-vaxxers display significantly *higher* levels of pro-social behavior than those who vaccinated at least once, across all three measures. This result is robust to controlling for demographic characteristics and additional mediating variables, including the number of past infections with Covid-19 and trust in the Ministry of Health. Moreover, when analyzing pro-sociality along the vaccination status, we observe a pattern that we term a *truncated U-shape*: Non-vaxxers exhibit the highest levels of pro-social behavior, partially vaccinated show the lowest levels, and fully vaccinated fall between these two groups. This pattern remains consistent even when accounting for potential confounders.[1]

The difference in pro-social measures between vaxxers and non-vaxxers appears to question the prevailing public perception that views non-vaxxers as having low concern for the well-being of others. Moreover, the (truncated) U-shaped relationship between pro-sociality and the number of vaccinations appears puzzling. Following the presentation of our findings, we discuss several potential explanations and draw on the richness of our data to evaluate their plausibility. The mechanisms we consider are briefly discussed in Section 5 and then in detail in Appendix D. We begin by examining whether various covariates could account for our findings, including income, education, political stance, religiosity, trust in institutions, social media usage, and "alternative-lifestyle" variables. Our analysis shows that most of these covariates have no effect on the observed patterns, and those that do, explain only a small part of the binary distinction between vaxxers and non-vaxxers. Moreover, none of these covariates can account for the U-shaped relationship between pro-sociality and the number of vaccinations. We then turn to consider some other channels. One such important channel is social norms. Since both vaccination and prosociality are plausibly subject to social norms, it seems reasonable that social norms would be an underlying latent variable that explains their joint variability. However, as elaborated in Section 5 and in Appendix D.3.2, the data does not support this explanation. First, some of our results actually move in the opposite direction of what one would expect if they were driven by social norms. Second, the truncated-U pattern persists across all three measures, including trust in others as reflected by player A's transfers in the TG—a measure widely regarded as unrelated to social norms (Bicchieri et al., 2011; Dunning et al., 2014).

We therefore acknowledge that, while social norms are likely at play, they are not the primary channel driving our results. Instead, we view their influence as indirect, operating through a mechanism that is based on individuals' ability to act in line with what they perceive as "the right thing to do"—their principles—even when it is difficult to do so. We naturally assume that this ability is heterogeneous in the population and, for brevity, we refer to it as an individual's *strength of convictions*, or simply convictions.[2] This explanation, while not fully identified, aligns with the data more closely than the others, especially given the supporting evidence in Section 7. The crux of the argument is that the strength of one's convictions is the latent variable underlying both transfers in the experimental games and adherence to one's principles regarding vaccination. In particular, convictions matter when it comes to adhering to a rule that is hard to follow. In many economic situations, including our experimental games, there exists a tradeoff between

[1] Our results show little variation between the three measures, so we treat them here and in other places collectively as "pro-sociality measures". Indeed, a recent systematic classification of experimental tasks (Chapman et al., 2023) places these three measures in the same category, which the authors associate with the general trait of generosity. We do, however, also present and analyze the results separately for each measure. We elaborate on this in Section 2.

[2] We thank Alexander Cappelen for suggesting this potential mechanism.

self-interest and one's moral principle of what constitutes a fair allocation (Cappelen et al., 2007). Resolving this tradeoff leads individuals to align more closely with one or the other, depending on the strength of their convictions. Those with strong convictions tend to make transfers that closely reflect their fairness ideals, whereas those with weaker convictions may fall short of their ideals and keep a larger share of the pie for themselves than their personal ideal would dictate. In games of the type we study, there is a broad consensus regarding what constitutes the "right" or moral action—being generous and fair, splitting equally, and so on. Consequently, actual transfers in the games can, to some extent, serve as a reasonable proxy for convictions.[3] We use this insight to interpret variation in transfers by vaccination status as a (noisy but informative) indication of how *convictions* differ across vaccination groups. As opposed to pro-sociality ideals, judgments about the "right thing to do" regarding vaccination are highly polarized. Vaccination status therefore does not serve as a simple proxy for convictions but instead reflects the joint influence of views and convictions. This makes things trickier, but, as explained below, there is a natural decomposition of vaccination decisions into views and convictions. Once decomposed, the truncated U-shape of transfers (hence, convictions) as a function of the number of vaccinations becomes readily interpretable.

The decision to vaccinate against Covid-19 comprises two elements: Principles ("pro-vaccine" or "anti-vaccine") and convictions. For anti-vaccine individuals, adhering to their anti-vaccine principle all the way till the end of the pandemic was costly since it required, for example, facing stigma, potential job loss, or exclusion from public spaces. Under these circumstances, some anti-vaccine individuals—those with weaker convictions—may have opted to vaccinate (partially of fully) against their principles. Others, specifically those with stronger convictions, were less likely to move away from their principle and remained non-vaccinated until the end of the pandemic despite the associated costs. In contrast, pro-vaccine individuals faced a relatively straightforward decision as they were likely to follow their pro-vaccine view and vaccinate. This is because, in addition to their inherent inclination to vaccinate, the costs of not vaccinating (such as government restrictions and stigma) likely outweighed the costs of vaccinating. Thus, since the net costs did not drive them away from their principles, convictions were unlikely to influence their vaccination decision, and the average level of convictions among pro-vaccine individuals is therefore expected to reflect that of the general population. Consequently, if we were to qualitatively rank average convictions by vaccination status, we would expect the highest level among non-vaxxers (anti-vaccine individuals who clung to their principles), the lowest levels among the partially vaccinated (likely anti-vaccine individuals who compromised their principles), and intermediate levels among the fully vaccinated (pro-vaccine individuals along with

[3] For example, in the DG, the fairness ideal held by all fairness types of Cappelen et al. (2007) except for the libertarian type is to split the endowment equally. Indeed, there is a well-documented consensus on the amount that should be given in this game ($\sim$50% of one's endowment), and a well-documented gap between this amount and the amount that is actually transferred when it is played with real stakes (details in Section 6). This gap highlights the difficulty some individuals face in "doing the right thing."

some anti-vaccine with weak convictions). Viewing transfers as an imperfect proxy for convictions yields the truncated U-shape pattern observed in the data.[4]

The (late) timing of our study lends further support for this convictions mechanism, since the relationship between convictions and vaccination status became meaningful only after the stigma surrounding non-vaccination and the pressure associated with the decision not to vaccinate had built up and impacted the decisions of the anti-vaccine individuals. Consequently, this channel was very unlikely to show up in studies regarding early adoption of the vaccine that were conducted in the early stages of the pandemic. We elaborate on this point in the next section, where we compare our findings with studies conducted in those earlier phases.

We provide further support for the underlying channel of convictions by leveraging the richness of our data. We start by focusing on the group of partially- and fully-vaccinated individuals who reported vaccinating *due to* external pressure. Their admission of vaccinating due to pressure indicates that their decision conflicted with their anti-vaccine principles, so we categorize them—alongside those who reported not vaccinating for reasons that are not purely health related—as "admittedly anti-vaccine." For this group of anti-vaccine individuals, the convictions-based mechanism predicts a monotonically decreasing pattern of average transfers along the vaccination status: Due to their anti-vaccine stance, the more vaccination doses they received, the weaker their convictions are expected to be, which should be further reflected in lower transfers in the experimental games. This prediction is indeed confirmed by the data. Next, we focus on the partially vaccinated group, who are likely anti-vaccine based on their "interim" vaccination status. We divide them into two subgroups based on whether they reported vaccinating due to pressure. Since both groups are likely anti-vaccine, those who reported being subject to external pressure might not have vaccinated if they hadn't encountered it. Hence, it is anticipated that, on average, they would hold stronger convictions compared to those who attained the same vaccination status without encountering such external pressures. This prediction is also met by the data. Finally, we shift our attention to the non-vaxxers and order their explanations for not vaccinating according to their level of anti-vaccine sentiment. Following the convictions-based mechanism, we predict (and, once again, confirm) that those who indicated more ideologically-motivated reasons for not vaccinating have higher average transfers than those who mentioned health-related concerns.

Our study examines pro-sociality in the context of Covid-19 vaccination, but the underlying insight is more general. When governments promote behavior that is framed as protecting society, individuals who do not comply are often judged negatively by the conforming majority, and non-compliance may be interpreted as a lack of pro-social concern.

[4]This explanation is silent about the origins of principles and takes as given that individuals' principles regarding vaccination and pro-sociality have already been shaped. Social norms might shape these principles, alongside other factors such as education and personal morality. In this suggested mechanism, however, all such influences are embodied in the individual's principles.

Similar dynamics may arise in other settings, such as mandatory civil or military service, or tax compliance during the reign of a deeply controversial regime. For example, in the case of civil or military service in countries where these are obligatory, refusal to serve is frequently viewed as a lack of solidarity with society's goals. Yet such behavior may instead reflect deeply held principles and a willingness to incur substantial personal costs to act in accordance with them, rather than low pro-sociality.

The paper proceeds as follows. In Section 2 we review the related literature and compare our work to studies relating vaccination to pro-sociality that were conducted in earlier stages of the pandemic. Section 3 outlines the experimental design, and section 4 presents the results, beginning with a comparison between vaxxers and non-vaxxers and then examining the broader relationship between transfers in the experimental games and vaccination status. In Section 5 we briefly review—and rule out—several alternative explanations for the observed patterns, and in Section 6 we present the conviction-based mechanism. Section 7 lends further support for this mechanism and Section 8 provides its formal model. Section 9 concludes.

## 2 Related Literature

There are several studies that examine the relationship between pro-social or civic behavior on the one hand, and compliance with preventive measures against Covid-19 on the other hand. Most of these studies were conducted at the country/regional level and were held before the vaccine was available for distribution.

Bartscher et al. (2021) explored the correlation between civic capital, measured by voter turnout, and health outcomes during the Covid-19 pandemic. Their findings revealed that higher levels of this form of civic capital are associated with a lower number of Covid-19 cases per capita and a decrease in excess deaths caused by the disease. Barrios et al. (2021) and Goldstein and Wiedemann (2022) examined a similar type of civic capital and discovered a positive correlation with reduced physical mobility and increased levels of social distancing during the pandemic, i.e., with higher compliance with national authorities' recommendations. Barrios et al. (2021) also utilized a self-reported measure of trust in others, obtained through a non-incentivized survey question, as an alternative proxy of civic capital. Their findings revealed a positive correlation between this trust measure and social distancing.

Still prior to vaccine distribution but somewhat closer to our work, is the research conducted by Campos-Mercade et al. (2021), Fang et al. (2022) and Sternberg et al. (2024), which examine correlations at the individual level between pro-sociality and adherence with Covid-19 preventive behaviors. Campos-Mercade et al. (2021) use an incentivized experimental game that builds on the dictator game and find that one's willingness to risk the endowment of another person for their own financial benefit is negatively correlated with wearing a mask, washing hands and avoiding social contact. Fang et al. (2022)

use experimentally validated survey questions based on Falk et al. (2023) and find that individuals who express higher pro-sociality in the survey have higher compliance rates with public health recommendations during the pandemic. Sternberg et al. (2024) follow a similar methodology, but their measure of pro-sociality is a weighted average of an incentivized donation decision and experimentally validated survey questions. They also find a positive correlation between pro-sociality and compliance with preventive measures, but the correlation loses its statistical significance after adding socio-demographic controls.

We are aware of three experimental studies relating social preferences at the individual level to the decision to vaccinate against Covid-19. The first two are Basili et al. (2022) and Reddinger et al. (2024), who examine contributions of vaxxers and non-vaxxers in the public goods game (PGG) in Italy and the USA, respectively. Data in these studies was collected in 2021, shortly after the vaccine was introduced and distributed in those countries. Both studies find that early adopters of the vaccine tend to contribute more than others in the PGG (only marginally so in Basili et al., 2022). The third paper, Sasaki and Kurokawa (2022), employs the DG, the same game that we use as our first measure. While they focus on in-group bias, they also report no statistically significant gap in DG giving between vaccinated and non-vaccinated individuals when the recipient in the game is anonymous (as in our set up). Their data was gathered in Japan in February 2022, placing it chronologically between the earlier data collection of Reddinger et al. (2024) and Basili et al. (2022), and our own later data collection.

While our study differs in the specific pro-sociality measures, the main and most important distinction between these three papers and our own lies in the timing. These studies were carried out earlier in the pandemic while our data was collected at its conclusion. The first two studies focused on the decision to adopt the vaccine early, in the months following its introduction. Some individuals who were non-vaccinated in those studies may have in fact been pro-vaccine but felt no urgency to vaccinate so soon. Others may have been anti-vaccine who ultimately received the shots later as the pandemic evolved. However, at the early point these studies captured, those anti-vaccine individuals had not yet encountered sufficient external pressures to do so. These pressures intensified over the course of the pandemic and were stronger during the period in which the study was run in Japan by Sasaki and Kurokawa (2022). By the time our study was conducted, these pressures had peaked.[5] Therefore, individuals who were non-vaccinated in earlier studies may have become partially or fully vaccinated later on.

This timing difference, along with the pressures that evolved during the pandemic, reveals two meaningful observations in our data that were not accessible in prior studies. First, non-vaxxers in our study had ample time to deliberate their decision. They were very persistent, as they steadfastly clung to their decision to decline the vaccine despite

[5]By pressures we generally refer to social stigma against non-vaxxers as well as government or workplace requirements to vaccinate. Our data allows us to distinguish between the two to a large extent, and we do so when we analyze the data and discuss potential explanations.

facing various external influences, such as stigma and pressure from their workplace and the government throughout the years 2021 and 2022. At the early stage in which the aforementioned studies were conducted, it was impossible to distinguish between persistent non-vaxxers, non-vaxxers who would later partially (or fully) vaccinate under increasing pressures, and pro-vaccine individuals who simply felt no urgency to vaccinate early. Second, at the time of data collection of the earlier studies, distinguishing between partial and full vaccination was nearly impossible, while the timing of our study allows us to make this distinction. Partial vaccination represents a compromise between full vaccination and no vaccination and therefore encompasses important information about individuals' ability to cope with pressure—an ability that is likely to play a role in many contexts. Conducting the study at the end of the pandemic enables us to distinguish three degrees of vaccination complacency and to uncover a novel, and previously undocumented, pattern linking these levels to pro-sociality.

More broadly, the Covid-19 pandemic serves as a salient case study of a wider class of policy environments in which governments promote behavior framed as socially beneficial and exert pressure to induce compliance. In such settings, observed compliance need not map monotonically into underlying pro-social motivations, particularly when individuals differ in their principles and in their willingness to incur personal costs in order to adhere to them. In line with this broader perspective, and with our suggested channel of convictions in mind, we propose that the patterns found in the data relate to the well-documented gap between principles and actions. Individual variations in this gap may then be the latent factor that links transfers in our experimental games and vaccination status. This gap is in fact a general and pervasive phenomenon. In psychology, it is studied under the notion of attitude–behavior consistency, which concerns the alignment of intentions and actions within the theory of planned behavior (Ajzen and Fishbein, 1977; Ajzen, 1991). This gap has been shown to matter in economics as well, particularly in environmental behavior (Gilg and Barr, 2006; Ghani et al., 2013; Wolters, 2014) and in tax compliance (Guerra and Harrington, 2018). The latter, for example, demonstrate that the extent to which individuals follow their tax morale (i.e., their attitude–behavior consistency in the tax domain) is key to explaining why Danish lab participants, despite reporting higher tax morale on average, evade taxes more often than Italian participants.

## 3 Experiment

The experiment consisted of two questionnaires, distributed to the same participant pool in October 2022, with an interval of approximately ten days between them. The questionnaires were distributed to a representative sample of the Israeli adult population through Panel4All, a large Israeli panel company. Both questionnaires appear in appendix E.

In the first questionnaire, participants were asked different questions related to Covid-19: Did you receive vaccination against Covid-19 and, if so, how many times? Were you ever infected with Covid-19 and, if so, how many times? In addition, those who reported not getting vaccinated were asked for the reason for refraining from doing so. They were given four possible options that included: "not being convinced of the vaccine's effectiveness," "not being bothered by the risk of contracting the disease," "being concerned about side effects," and "health reasons". They could also choose "other" in which case they were provided with space to elaborate on their reason. Those who indicated having received at least one shot of the vaccine were asked if they received one of the first two shots due to pressure from work and/or pressure due to the green-pass restrictions.[6]

The second questionnaire was sent to all participants who completed the first, approximately ten days later. This time around participants were presented with two games in random order: The DG and the TG. In the DG, player A, the "dictator," was endowed with 40 ILS (∼$12) and had to decide how much of the total amount to pass over to player B (the options were to transfer 0,10,20,30, or 40 ILS). The decision of player A determined the final outcome of the game. The first stage of the TG was identical to the DG, i.e., player A was endowed with 40 ILS and had to decide how much to transfer to player B. At this stage, the amount transferred by player A was multiplied by 3 and player B had to decide how much of the tripled amount to transfer back to player A (in increments of 10 ILS). Player B was asked how much s/he would like to transfer back to player A for every possible amount transferred to her/him by player A, i.e., using the strategy method. Choices made in the games were incentivized: Ten percent of those who completed both questionnaires were randomly matched and received payoffs according to their decision in one of the two games played in one of the two roles (both randomly determined), in addition to the participation fee. Following the games, participants were asked a few additional questions designed to rule out other potential explanations for the relationship between vaccination and pro-sociality. These explanations, alongside others, are described in detail and examined in Appendix D.

Importantly, participants were provided no information that could link the two questionnaires to each other, and they were of entirely different nature: the first included a few general questions about the pandemic and offered only a flat-rate payment for completion, while the second introduced two incentivized games. The researchers' identities were not directly disclosed.[7] Moreover, participants received many other surveys by the panel company between our two questionnaires, further reducing the likelihood that they would associate the two parts of our study. The separation between the two parts of our study and the different nature of these parts, makes it practically impossible that participants somehow linked the two waves. Consequently, it seems very unlikely that their behavior in the DG and TG was influenced by their responses to the questions on vaccination status.

[6]During the pandemic, the Israeli government introduced the green pass, which was granted to those who vaccinated and allowed them to enter public spaces such as restaurants, sports centers, theaters and other social gatherings.

[7]Participants could contact the researchers through the panel company that distributed the questionnaire.

A total of 1,992 participants completed the first questionnaire; 1,562 of them completed the second questionnaire as well, forming the basis for our analysis.[8] The study was pre-registered on the OSF registry. The registration DOI is:
https://doi.org/10.17605/OSF.IO/TWGPK.

# 4 Results

## 4.1 General

Table 1 shows the distribution of the number of vaccinations in our sample and in the general population (as provided by the Israeli Ministry of Health) in October 2022. 201 participants (12.9% of the sample) didn't receive a single dose of vaccination, with nine of them citing health reasons as their sole justification for choosing not to get vaccinated.[9] Comparing the share of non-vaxxers in our sample to their share in the population (10.7%) provides reassurance that non-vaccinated individuals did not misreport their vaccination status. Among those who received at least one vaccination, 653 reported doing so due to pressure from their workplace or due to green-pass pressure. As pre-registered, we conduct our analyses separately with and without these 662 individuals (653 who reported vaccinating due to pressure + 9 who cited health reasons as their sole justification for choosing not to get vaccinated).[10] In the current section we run our analyses excluding these individuals (leaving us with 900 participants). In Section 7.1 we show and discuss how the results differ for the 653 individuals who reported vaccinating due to workplace or green-pass pressure, and in Appendix B we report the analyses performed using the entire sample, as well as all the pre-registered tests, which, by and large, corroborate the results presented in the main text. Note that excluding those who indicated vaccinating due to workplace or green-pass pressure does not imply that the remaining individuals did not experience any pressure. They might have experienced different types of pressure, especially informally (e.g., risking being stigmatized as irrational anti-vaxxers), or even the same type of pressure that we mentioned in the questionnaire but without perceiving it as a force that compelled them to vaccinate.

## 4.2 Socio-Demographic Determinants of Vaccination

We first conduct a "sanity check" and examine the effect of various socio-demographic characteristics—some of which are well-established determinants of vaccination—on a binary

[8]There were no statistically significant differences in terms of the answers to the first questionnaire (and, in particular, in the distribution of the number of vaccinations) between those who completed both questionnaires and those who dropped out after the first one.

[9]According to our pre-registration, we also checked whether there were any participants who only marked "other reason" for not vaccinating and provided an explanation that could exempt them from being required to vaccinate. However, we did not identify any such participants.

[10]This is inspired by Reddinger et al. (2024), who argue that voluntary and mandated vaccination may differ when it comes to revealing pro-social motivations.

vaccination status (where vaccinating at least once is coded as one, and not vaccinating is coded as zero). The results appear in Table 2.[11] As expected, we find that older individuals and those with higher income are more likely to vaccinate, while the religiously orthodox, the non-Jewish minority, and those who belong to the political right wing are less likely to vaccinate, all else equal. These findings are very much in line with previous research about socio-demographic determinants of Covid-19 vaccine hesitancy (Malik et al., 2020; Robinson et al., 2021; Razai et al., 2021; Khubchandani et al., 2021; Hussain et al., 2022).

### 4.3 Overview of Pro-Sociality and Vaccination

This subsection compares the different pro-sociality measures for vaxxers, i.e., those who received at least one vaccination dose, and non-vaxxers. Figure 1 shows the average pro-sociality measures for the two groups. As is apparent from the figure, we find that non-vaxxers have on average higher pro-sociality measures than vaxxers, and this pattern holds across all three measures. The T-tests comparing the averages of the pro-sociality measures reveal a highly statistically significant difference between the two-groups' averages, as shown in Table 3.[12]

Next, we regress each measure of pro-sociality on the binary vaccination variable. Each regression includes four specifications. The first specification only controls for the order in which the DG and TG appeared in the second questionnaire. In the next specifications we sequentially incorporate the number of Covid-19 infections, socio-demographic characteristics, and trust in the Ministry of Health, which participants were asked to indicate following the experimental games. Tables 4, 5, and 6 summarize the findings.[13] For all measures and across all specifications we find that vaccinating is correlated with lower

**Table 1:** Distribution over Number of Vaccinations (absolute numbers in parenthesis)

| # Vaccinations | Sample | Population |
|---|---|---|
| 0 | 12.9% (201) | 10.7% |
| 1 | 5.8% (91) | 6.3% |
| 2 | 18.4% (287) | 18.2% |
| 3+ | 62.9% (983) | 64.8% |
| Total | 100% (1,562) | 100% |

[11]Here we present the results of the linear regression analysis; the results remain qualitatively similar when employing a Logit model—see Table B27 in Appendix B.

[12]Wilcoxon-Mann-Whitney tests provide a qualitatively similar separation between the two groups with $p < 0.001$ for all measures. According to our pre-registration, we also compared the difference in the level of trust in the Ministry of Health across groups. As expected, vaxxers have a statistically significantly higher average level of trust (3.538) than non-vaxxers (2.216), with $p < 0.001$. Since this comparison is not our main interest, it is not reported in the table.

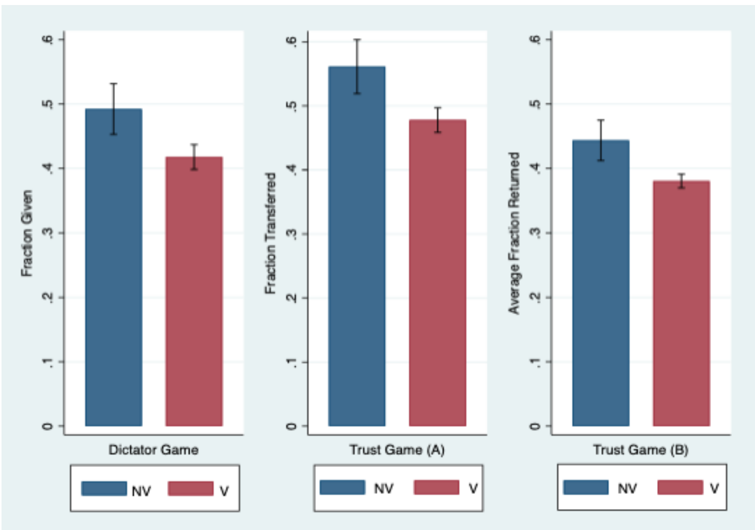
[13]Table B22 in Appendix B reports the $p$-values after adjusting them for multiple hypotheses testing using the Romano-Wolf correction. The adjusted values do not change any of the qualitative results. The adjustment of the p-values for the T-tests in Table 3 are not reported as it is evident that they remain significant even after a Bonferroni correction, let alone a Romano-Wolf correction.

**Table 2:** Vaccination by Socio-Demographic Characteristics

| | Vaccinated (Yes=1/No=0) |
|---|---|
| Age | 0.01*** |
| | (0.00) |
| Female | -0.04 |
| | (0.03) |
| High Education | 0.04 |
| | (0.03) |
| High Income | 0.12*** |
| | (0.02) |
| Minority (Non-Jewish) | -0.14** |
| | (0.06) |
| Religiously Orthodox | -0.17*** |
| | (0.06) |
| Right Wing | -0.07** |
| | (0.03) |
| $R^2$ | 0.13 |
| Observations | 900 |

*Notes:* A linear regression of the vaccination status (1 if vaccinated at least once and 0 otherwise) by socio-demographic characteristics. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. Standard errors in parentheses.

**Figure 1:** Pro-sociality Measures for Vaxxers and non-Vaxxers




*Notes:* The left panel shows average giving in the DG, the middle panel shows average amount sent by Player A in the TG (trust in others), and the right panel shows average amount returned by Player B in the TG (trustworthiness) transfers. To interpret the magnitude of the result, consider for example specification (1) in Table 4: Compared to a non-vaxxer, a vaccinated person gives an amount that is, on average, smaller by 7.5% of the endowment (3 ILS, i.e. about \$0.85, from an endowment of 40 ILS). Controlling for the number of infections has almost no bearing on the magnitude of the vaccination coefficient. The inclusion of the socio-demographic factors takes away some of the explanatory power of the vaccination variable in Tables 4 and 5, but the association between vaccination and all pro-sociality measures remains substantial and statistically significant across all four specifications for the three measures.

**Table 3:** Averages Transfers

| | Vaxxers ($n$=708) | non-Vaxxers ($n$=192) | t-statistic | p-value |
|---|---|---|---|---|
| Average Giving in DG | 0.418 | 0.492 | 3.493 | $< 0.001$ |
| Average Sent in TG (Player A) | 0.478 | 0.561 | 3.792 | $< 0.001$ |
| Average Returned in TG (Player B) | 0.381 | 0.446 | 3.904 | $< 0.001$ |

*Notes:* Average transfers of the dictator in the DG, of Player A in the TG and average returns of player B in the TG, for vaxxers in column 2 (received at least one vaccination) and non-vaxxers in column 3 (received no vaccination). Column 4 reports the t-statistic of a comparison of the means across groups and the p-value is reported in column 5.

**Table 4:** Giving in DG by Vaccination

| | Fraction Given | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer | -0.075*** | -0.072*** | -0.064*** | -0.066** |
| | (0.022) | (0.022) | (0.024) | (0.026) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.014 | 0.015 | 0.026 | 0.026 |
| Observations | 900 | 900 | 900 | 900 |

*Notes:* A linear regression of the fraction given in the DG by vaccination status (Vaxxer=1 if vaccinated at least once and 0 otherwise) with controls added gradually. Order refers to whether the DG or TG appeared first in the questionnaire. # of Infections refers to the number of times the individual contracted Covid-19. Socio-demographics include age and dummies for gender, high education, high income, religion (Jewish = 1), being orthodox, and belonging to the political right wing. Trust Moh refers to the degree of trust in the Ministry of Health on a scale of 1–5. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Standard errors in parentheses.

**Table 5:** Fraction Sent in TG (Player A) by Vaccination

| | Fraction Sent | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer | -0.084*** | -0.085*** | -0.071*** | -0.074*** |
| | (0.024) | (0.024) | (0.025) | (0.028) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.016 | 0.016 | 0.038 | 0.038 |
| Observations | 900 | 900 | 900 | 900 |

*Notes:* A linear regression of the fraction sent in the TG by vaccination status (Vaxxer=1 if vaccinated at least once and 0 otherwise) with controls added gradually. Order refers to whether the DG or TG appeared first in the questionnaire. # of Infections refers to the number of times the individual contracted Covid-19. Socio-demographics include age and dummies for gender, high education, high income, religion (Jewish = 1), being orthodox, and belonging to the political right wing. Trust Moh refers to the degree of trust in the Ministry of Health on a scale of 1–5. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Standard errors in parentheses.

**Table 6:** Average Fraction Returned in TG (Player B) by Vaccination

| | Average Fraction Returned | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer | -0.066*** | -0.066*** | -0.068*** | -0.065*** |
| | (0.018) | (0.018) | (0.019) | (0.021) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.020 | 0.020 | 0.023 | 0.023 |
| Observations | 900 | 900 | 900 | 900 |

*Notes:* A linear regression of the fraction returned in the TG by vaccination status (Vaxxer=1 if vaccinated at least once and 0 otherwise) with controls added gradually. Order refers to whether the DG or TG appeared first in the questionnaire. # of Infections refers to the number of times the individual contracted Covid-19. Socio-demographics include age and dummies for gender, high education, high income, religion (Jewish = 1), being orthodox, and belonging to the political right wing. Trust Moh refers to the degree of trust in the Ministry of Health on a scale of 1–5. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Standard errors in parentheses.

### 4.4 Pro-Socility and Vaccination Status

Our initial findings show that non-vaccinated individuals transfer more in our experimental games compared to those who received at least one vaccine dose. Notably, there are important distinctions between individuals who completed the full vaccination series as required by the government and those who complied only partially. In this subsection, we examine the entire pattern of average pro-sociality measures as a function of the number of vaccinations. The panels in Figure 2 display the average fractions transferred by number of vaccinations in the three roles played in our games.

The truncated U-shape discussed in the introduction clearly arises in all measures. Bear in mind that individuals who received three vaccinations were considered fully vaccinated and there is therefore no reason to expect their pro-sociality measures to be different from those who vaccinated four times (which could also explain the relatively flat lines connecting these two groups in the graphs).[14] Hence, for the rest of the analysis, we will group together all those who vaccinated at least three times. Similarly, we can group together those who were partially vaccinated, i.e., received either one or two vaccinations. Note that this group is not as cleanly defined as non-vaxxers and fully-vaccinated individuals. The reason is that some individuals who received only a single shot likely did so because they contracted the virus beforehand, and were subsequently required to receive only one additional dose by the Ministry of Health. Consequently, the partially-vaccinated group includes individuals who might have fully vaccinated if they hadn't contracted Covid-19. Thus, the differences between these two groups reported below strengthen the conclusion that the "really partially vaccinated" individuals, i.e., those who vaccinated but did not fully comply with the recommendation of the Ministry of Health, are substantially different than the fully vaccinated group in their behavior in the DG and TG.

The panels in Figure 3 display the averages of the three measures for the grouped categories: Non-vaxxers (Non), partially vaccinated (Partial) and fully vaccinated (Full). As one would expect given Figure 2, the truncated U-shape emerges for this classification of vaccination status.

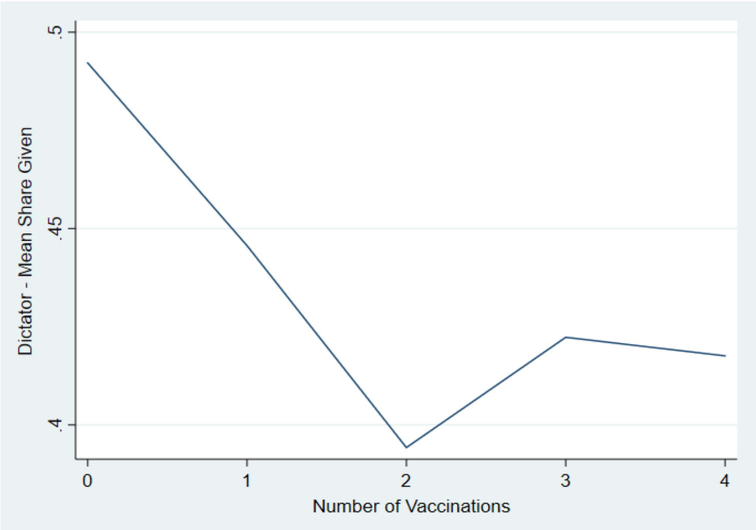
Next, we formally examine this truncated U-shape using a regression model. Since the patterns in Figure 3 are almost identical across measures, the dependent variable in our regression is the weighted average of the three transfers that participants had to decide upon in our experiment, i.e., a transfer index. Note that this index serves not only as a technical simplification but also, according to Chapman et al. (2023), the three measures composing the index are strongly related (capturing an attribute they call 'generosity').[15] The main explanatory variables are dummies for the different vaccination-status categories.

[14] At the time of our experiment the fourth vaccination, i.e., the second booster, was being administered to the elderly, populations at risk and others who explicitly requested the shot (e.g. for the purpose of travelling abroad).

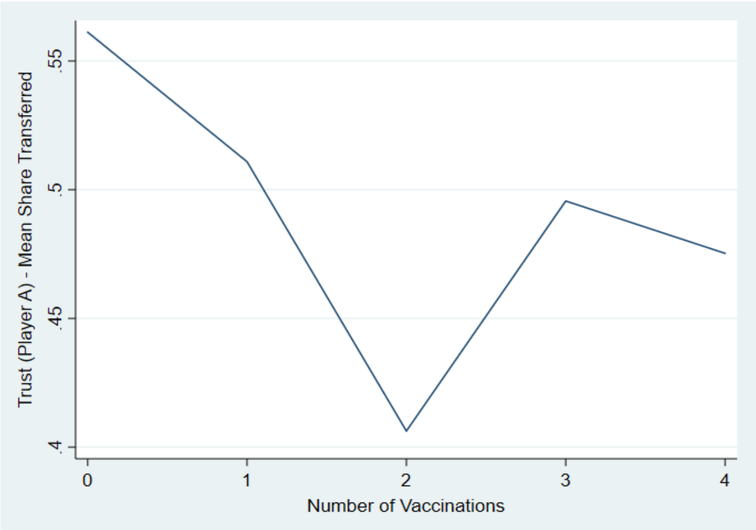
[15] Indeed, we find quite a strong positive correlation between each pair of measures ($\rho$=0.49-0.55, $p < 0.001$).

**Figure 2:** Average Fraction Transferred by Number of Vaccinations

Panel (*a*): Dictator Game




Panel (*b*): Trust Game (Player A)




Panel (*c*): Trust Game (Player B)

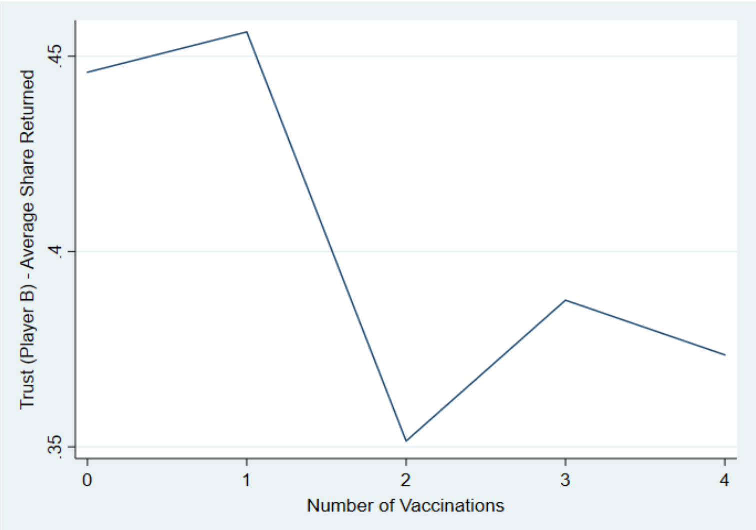
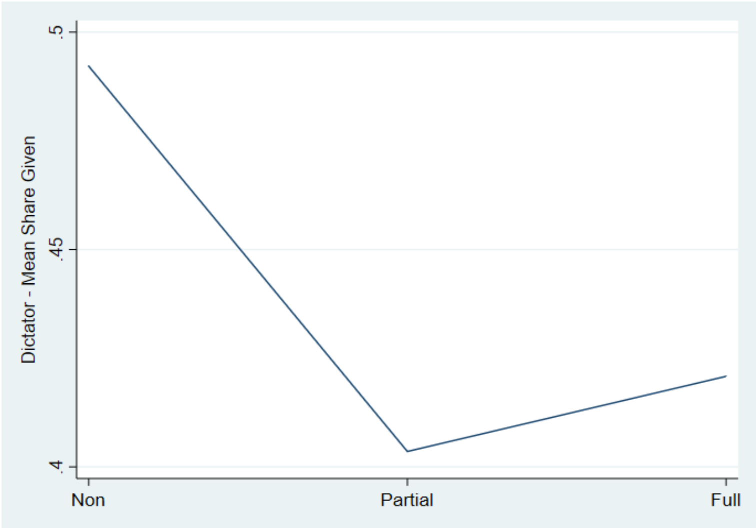
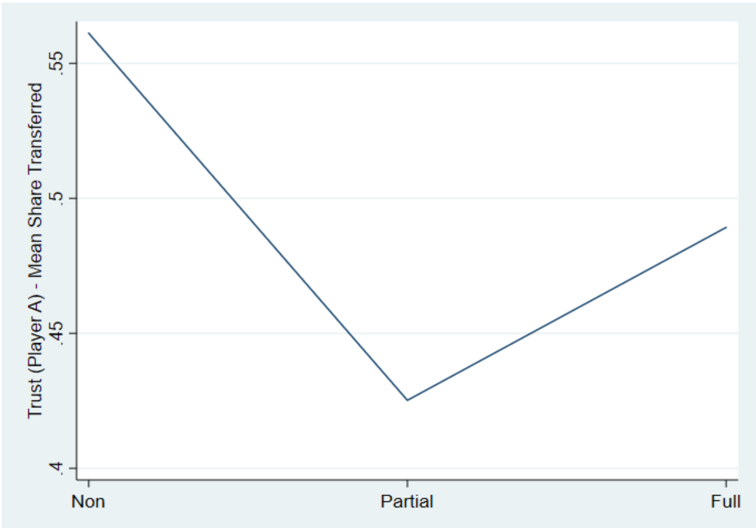


**Figure 3:** Average Fraction Transferred by Vaccination Status

Panel $(a)$: Dictator Game




Panel $(b)$: Trust Game (Player A)




Panel $(c)$: Trust Game (Player B)

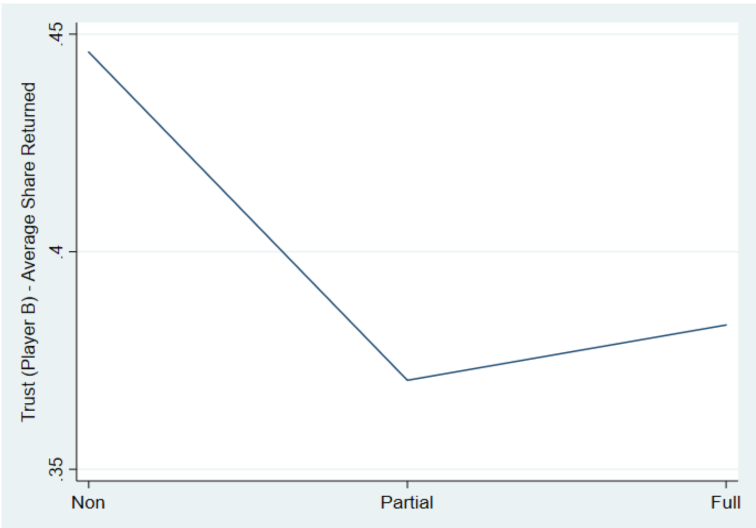


**Table 7:** Transfer Index by Vaccination Status

| | Transfer Index | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Partial Vaccination | -0.031 | -0.034* | -0.039** | -0.039* |
| | (0.019) | (0.020) | (0.020) | (0.020) |
| No Vaccination | 0.069*** | 0.068*** | 0.057*** | 0.057*** |
| | (0.018) | (0.018) | (0.019) | (0.021) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.027 | 0.027 | 0.037 | 0.037 |
| Observations | 900 | 900 | 900 | 900 |

*Notes:* A linear regression of the transfer index (a weighted average of the fraction sent in the DG and in each of the roles in the TG) by vaccination status, where the fully vaccinated (3 or 4 vaccination doses) are the omitted group, and where partial vaccination refers to receiving 1 or 2 vaccination shots. Controls added gradually. Order refers to whether the DG or TG appeared first in the questionnaire. # of Infections refers to the number of times the individual contracted Covid-19. Socio-demographics include age and dummies for gender, high education, high income, religion (Jewish = 1), being orthodox, and belonging to the political right wing. Trust Moh refers to the degree of trust in the Ministry of Health on a scale of 1–5. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Standard errors in parentheses.

Since the average transfers of the fully vaccinated lie between those of the other groups, they are naturally chosen to be the omitted group. The results are reported in Table 7 and they provide support for the pattern in Figure 3. In other words, across various specifications, the fully-vaccinated group exhibits a transfer index that is lower than that of the non-vaxxers but higher than that of the partially-vaccinated group. However, while the former relationship is statistically significant, the latter is only weakly significant, depending on the exact specification considered. Tables B24-B26 in Appendix B replicate Table 7 separately for each of the three measures. The tables show that, indeed, the non-vaccinated have statistically significantly higher levels in each measure compared to the fully vaccinated individuals. Moreover, the partially vaccinated individuals express lower levels of pro-sociality in all three measures, but the difference between these levels and that of the fully vaccinated is statistically significant only for trust in others. Given the likely "infiltration" of full compliers into the partially-vaccinated group (individuals who were required to receive only one dose due to being infected prior to the introduction of the booster shot), we think it is more scientifically sound to treat the differences between partially and fully vaccinated individuals as genuine. In the next section we briefly review—and rule out—several potential explanations for the observed patterns. In Section 6 we present an additional explanation that, unlike the others, *does* account for these patterns. This explanation can account for the entire U-shaped pattern, including the distinction between partially and fully vaccinated individuals, yet it is general enough to apply even if this distinction is absent.

## 5 Alternative Explanations: Brief Overview

Before turning to the explanation that we examine in greater depth below, we briefly review a broad range of potential explanations for the patterns documented above. Our analysis of these explanations—presented in full in Appendix D—shows that while several factors are correlated with vaccination and/or pro-social behavior, none can account for the distinctive patterns we observe.

First consider potential candidates from the large set of socio-demographic and attitudinal covariates we collected, including income, education, religiosity and political orientation. Although some of these variables significantly correlate with vaccination status, as apparent from Table 2, the third columns of Tables 4-7 tell us that they hardly affect the explanatory power of vaccination. In Appendix D.1 we consider two specific attitudinal covariates, religiosity (D.1.1) and political ideology (D.1.2), and explain why they cannot account for the patterns we find.

Next, channels related to social media usage (D.2.1) and alternative lifestyle (D.2.2) are examined. We find that greater involvement with social media—often associated with exposure to anti-vaccine content—correlates negatively with vaccination but is uncorrelated with pro-sociality. "Alternative-lifestyle" indicators such as self-perceived spirituality, use of alternative medicine, and vegetarianism, explain part of the binary difference in prosocial measures between vaxxers and non-vaxxers but leave most of the gap, and all of the truncated U-shape, unexplained once added to the regressions.

We further test whether trust in institutions (D.2.3) could underlie the pattern: individuals distrusting the government or health authorities might avoid vaccination while compensating for this lack of trust in institutions by exhibiting higher trust in others in situations similar to our experimental games. However, using a follow-up questionnaire that we ran a few months later as part of another research (details in Appendix D.2.3), we find that although trust in institutions negatively correlates with vaccination, it does not correlate with transfers in the Trust Game, and therefore cannot account for our results.

Cognitive ability is another possible latent driver that is considered (D.3.1), given prior evidence linking intelligence both to vaccination and to strategic behavior in experimental games. However, performance-based proxies in our data show no disadvantage among non-vaxxers, and the overall pattern contradicts what this mechanism would predict.

Likewise, an explanation based on social norms (D.3.2), according to which both vaccination and pro-sociality respond to conformity pressures, is not supported by the data. First, in order to generate the main binary pattern that shows higher transfers among the non-vaccinated, we would need to assume that the predominant social pressure was to *avoid vaccination*, rather than to vaccinate. This seems very unlikely in a society with a vaccination rate approaching 90%. The same is true when confining the analysis to the subgroup of "admittedly anti-vaccine" (see details in Section 7.1). Second, even if we try to explain the truncated-U shape by the existence of two conflicting vaccination norms, it is difficult to do so, because (i) the non-vaccination norm must be much stronger than the vaccination norm in order to generate the leftward tilt of the U-shape (as mentioned above, this seems very unlikely for the Israeli population); and (ii) the truncated U-shape is especially pronounced for trust in others, which is largely norm-independent (Bicchieri et al., 2011; Dunning et al., 2014). Taken together, social norms are also ruled out as an explanation for our findings.

Finally, we also rule out potential channels related to self-signaling (D.3.3), and vaccine availability (D.3.4). The latter was never an issue in Israel, where vaccines were in ample supply from the moment they became available. Self-signaling, like other explanations discussed in Appendix D, may shed some light on the binary pattern, but cannot account for the truncated U-shape.

Taken together, these analyses indicate that while multiple observable traits influence vaccination or pro-sociality individually, none of them can generate the full pattern we document. In the next section, we develop the convictions-based mechanism, which coherently explains the entirery of our observed patterns.

# 6 Explaining the Results with a Convictions-Based Mechanism

## 6.1 Convictions and Vaccination

The convictions-based explanation involves breaking down the vaccination decision into two stages. In the first stage, which is treated as a "black box", individuals form views (principles) regarding the need to vaccinate, making them either "pro-vaccine" or "anti-vaccine". The second stage involves the actual decision to proceed with vaccination or not. The pro-vaccine are likely to act upon their principle and vaccinate. This is because, in addition to their inherent principle, the drawbacks of abstaining from vaccination (such as green-pass restrictions and stigma) likely outweigh the costs of vaccinating. However, the decision made by the anti-vaccine is less straightforward. In the absence of external forces, these individuals are expected to choose to remain non-vaccinated. However, considerations such as the threat of a stigma might have compelled them to act against their principle and decide to get vaccinated. Thus, the second stage of the vaccination decision involves their ability to abide by their principles, which we will refer to as their (strength of) convictions.

The fact that our data was collected in the final phases of the Covid-19 pandemic underscores the potential significance of convictions in determining the vaccination status of our participants. Individuals in our sample had ample time to deliberate on their decision regarding vaccination. In other words, by remaining not vaccinated until October 2022, anti-vaccine individuals demonstrated that they were willing to pay a cost, such as damage to their social image and restrictions on their freedom of movement, in order to adhere to their principle that they should not vaccinate.

## 6.2 Convictions and Transfers in our Games

As with vaccination, behavior in the DG and TG reflects not only individuals' ideals—what they consider to be the right course of action—but also their readiness to uphold these values, even at a personal cost. This notion has been formally described by Cappelen et al. (2007), who present a utility function where agents assign weights to their material payoff and a fairness ideal. In the context of that model, we view a higher weight on the latter as analogous to having stronger convictions.

Indeed, the literature on the DG reveals a gap between a consensual stance on the right thing to do in this game—what one should do "in principle"—and actual transfers, which often deviate from this stance. Several studies have documented that a vast majority of people hold a personal normative belief that giving half of their endowment is the most appropriate action (e.g., Cappelen et al., 2007; Capraro and Rand, 2018; Bašić and Verrina, 2024). Cappelen et al. (2007) find that 82% of their participants hold a fairness ideal that dictates an equal split in the DG. Capraro and Rand (2018), in their Study 4, report that 88.8% of their participants indicate that giving half of their endowment is the morally right thing to do. Similarly, in a recent experiment by Bašić and Verrina (2024), 'giving half of the endowment' received the highest personal-norm rating in the responses of over 5 out of every 6 participants.[16]

Yet, actual behavior is far less generous. A meta-analysis by Engel (2011) spanning thirty years of studies of the DG in a wide range of countries and cultures, has gathered that dictators actually allocate half (or more) of their endowment only 29.8% of the time, and the average giving amounts to 28.3% of the endowment. In fact, this gap has already been documented in the very first experimental study of the DG by Forsythe et al. (1994). They find that the percentage of individuals who give half of their endowment drops substantially when the game is played for real stakes rather than hypothetically. Two recent studies echo these results. First, in the experiment of Bašić and Verrina (2024), 62% of the participants gave strictly less than their stated personal norm.[17] Second, Kurschilgen (2023) uses a slightly modified DG, and finds more evidence for this gap. He reports that "Faced with the incentivized choice, dictators become significantly more selfish...". These accumulated pieces of evidence show that principles are often followed only *in principle*, not in practice.

The conviction-based explanation builds upon Cappelen et al. (2007) and postulates that the fairness ideal—or principle—of the large majority of individuals is splitting equally. Moreover, it interprets the gap between this ideal and actual behavior as indicative of the

[16]This information does not directly appear in Bašić and Verrina (2024); it has been privately communicated to us by one of the authors.

[17]This information, too, is not reported in Bašić and Verrina (2024) and has been privately communicated to us by one of the authors.

role of convictions in determining the game's outcome: Individuals with strong convictions split equally, while those with weaker convictions, despite holding similar principles, are unwilling to pay the price of adhering to them. A similar argument applies to both roles of the trust game: Dunning et al. (2014) write that "People trust...because they feel it is...the action they ought to take," and Bašić and Verrina (2024) show that the highest ranked action of player B in terms of personal appropriateness is to send back the amount that equates the payoffs of both players (see Table A23 in their paper). In other words, most individuals agree about what the right thing to do is, yet fewer act accordingly when their own endowment is at stake. The gap between principles and actual behavior is expected to be further emphasized given the anonymity of our online setting, since it is likely to make the act of giving less rewarding than in social settings (Charness et al., 2007; Fiedler and Haruvy, 2009; Catola et al., 2021).

Some supporting evidence for this suggested link between convictions and transfers in our experimental games is provided in Appendix C (in particular Appendix Table C1). It shows a positive correlation between transfers in our experimental games and a non-incentivized proxy of convictions elicited in a follow-up questionnaire. Importantly, this non-incentivized proxy of convictions is unrelated to pro-sociality (it revolves around fighting for one's beliefs and ideological activism).

### 6.3 Linking Vaccination and Transfers through Convictions

In light of the two previous subsections, we propose a mechanism where the notion of convictions serves as a link that explains the relationship between individuals' vaccination status in the later phases of the pandemic and their behavior in the DG and TG. Non-vaxxers have demonstrated the strength of their convictions by refraining from vaccination, despite increasing pressures to do so, until the end of the pandemic. In our experimental games, it can be anticipated that their strong convictions will be manifested in their ability to align their transfers with what they perceive to be the right course of action. This results in transfers that tend to surpass, on average, those made by the general population. The same line of reasoning implies that partially-vaccinated individuals posses weak convictions, as it is likely that they were anti-vaccine but still partially vaccinated to get rid of the "anti-vaxxer" stigma (had they been pro-vaccine, they would have chosen to fully vaccinate). In line with the suggested link between convictions and behavior in our experimental games, their weak convictions are indeed expressed by their below-average transfers. Finally, the fully-vaccinated group comprises mostly pro-vaccine individuals whose convictions were not tested, as they simply followed their views and vaccinated. Hence, their average level of convictions is likely to be close to the population mean. Consequently, according to our suggested mechanism, their average level of transfers is expected to lie between the averages of the two other groups, an expectation that is indeed met by the data. Overall, this leads to the observed truncated U-shape of pro-sociality as a function of the vaccination status. However, the fully-vaccinated group likely also consists of a minority of individuals who are anti-vaccine but still fully vaccinated to overcome the stigma (i.e., they have weak convictions). This group is likely to pull the pro-sociality measures of our fully-vaccinated group downwards. Thus, while the convictions-based mechanism predicts a clear separation between non-vaxxers and the rest of society, it does not predict a similar "clear cut" separation between the partially- and fully- vaccinated groups. Put differently, the conviction-based mechanism is valid even if one adopts a more conservative approach that treats the observed difference between the average transfers of partially and fully vaccinated as merely a measurement error.

Interestingly, a recent working paper (Sasaki and Kurokawa, 2022), which was already discussed in Section 2, corroborates this convictions-based mechanism. Sasaki and Kurokawa (2022) elicit the amount that a dictator gives to an anonymous counterpart in both a hypothetical and an incentivized setting. The gap between hypothetical and incentivized giving is smaller for non-vaccinated individuals (11.84 Japanese Yen) compared to vaccinated individuals (17.49 Yen), with a statistically significant difference between the two groups ($\Delta = 5.65,\ p < 0.01$).[18] In other words, non-vaccinated individuals give amounts that are more aligned with what they believe should be given than vaccinated individuals do.[19] In the next section, using the richness of our data, we provide further support for the conviction-based mechanism.

# 7 Further Support for the Convictions-Based Mechanism

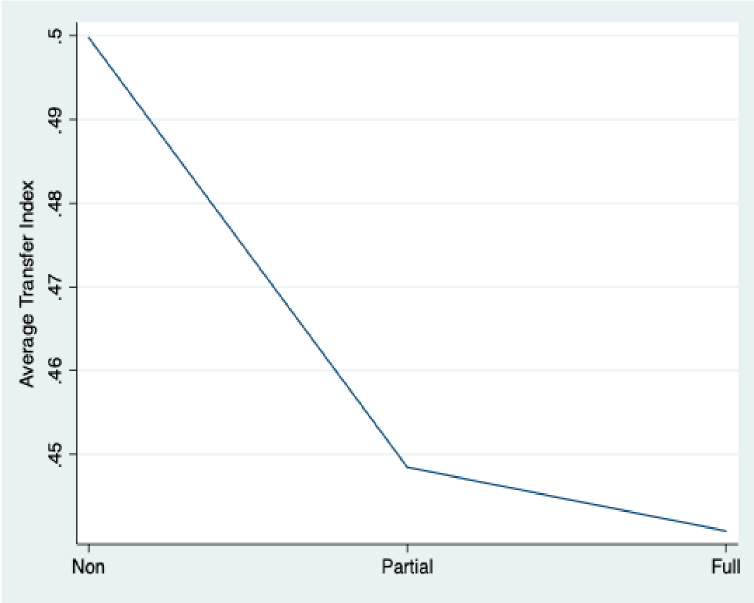
## 7.1 Pressure to Vaccinate

Up until this point, we excluded individuals who reported vaccinating due to workplace or green-pass pressure. In this subsection we turn our attention over to these individuals. It is worth noting that the pressure indicated by our participants is likely substantial. For instance, some individuals were forced to vaccinate in order to retain their employment. In other words, by indicating that they vaccinated *due* to workplace or green-pass pressure (or both), individuals reveal their anti-vaccine stance (if they were in favor of vaccination, they would not have indicated doing so due to external pressure). To this group we also add the non-vaxxers, excluding those who reported health reasons as their sole justification for not vaccinating. The combination of these groups—non-vaxxers and those who vaccinated due to pressure—may be thought of as "admittedly anti-vaccine" individuals: They either got vaccinated and acknowledged doing so due to external pressure, or remained non-vaccinated, citing reasons that reflect anti-vaccine views.

[18]This statistical comparison of the gaps does not appear in their paper as it was not part of their research question. We made this calculation ourselves based on the data that appears in Table 2 of their WP.

[19]Note that while their data collection was earlier than ours, it took place late enough in the pandemic (early 2022) for non-vaccinated individuals to have already shown some resilience to stigma and other pressures (unlike Basili et al. (2022) and Reddinger et al. (2024) who dealt with early adoption of the vaccine).

**Figure 4:** Average Transfer Index by Vaccination Status: Admittedly Anti-Vaccine




The convictions-based mechanism provides a straightforward prediction of average transfers for the "admittedly anti-vaccine" as a function of their vaccination status. Given their clear anti-vaccine stance, those who fully vaccinated are expected to have weaker convictions, and hence lower transfers, than those who partially vaccinated, since the latter adhered more closely to their anti-vaccine principles. By the same token, the non-vaxxers in this group are expected to demonstrate the highest transfers, as they did not give-in to pressure at all. Thus, looking at this group of admittedly anti-vaccine individuals, we expect monotonically decreasing average transfers as we move along the vaccination status, from non-vaxxers through partially vaccinated and over to the fully vaccinated. Figure 4 shows the average transfer index for the different vaccination statuses for this group. Indeed, it shows a monotonically decreasing trend in average transfers as we move along the vaccination status.

## 7.2 Zooming-in on the Partially Vaccinated

Following the convictions-based mechanism, one might naively expect individuals who revealed obtaining the vaccine due to work or government pressure to exhibit lower transfers than those who did not indicate pressure and reached the same vaccination status. After all, they themselves acknowledge giving in to pressure. However, this conclusion is premature. Imagine two anti-vaccine individuals, person $A$ and person $B$, who work at the same workplace and ended up receiving the same number of vaccinations by the end of the pandemic. Person $A$ decided to get vaccinated as soon as the stigma against non-vaxxers emerged. Person $B$, despite facing the same stigma, remained non-vaccinated. Later, their workplace issued an ultimatum requiring vaccination for continued employment, leading Person $B$ to reluctantly get vaccinated too. It is clear that Person $B$ has stronger convictions than Person $A$. Therefore, the extent of experienced pressure must be taken into account before we make any conjectures about the relationship between one's indication of vaccinating due to pressure and one's expected level of convictions.

With this in mind, let's zoom in on the partially-vaccinated group. All individuals in this group reached the same vaccination status by the end of the pandemic. Furthermore, recall that this group likely consists only of anti-vaccine individuals.[20] Hence, according to the convictions-based mechanism, those within the partially-vaccinated group who experienced pressure should, on average, have higher transfers than those who did not. This is indeed confirmed by the data, as the average index of the former group is 0.45 and the average index of the latter is 0.40. The difference between the two indices is statistically significantly different from zero ($t = 2.2879,\ p = 0.0227$), and remains statistically significant when we gradually add controls, as shown in Table 8.[21]

**Table 8:** Transfer Index by Pressure Among Partially Vaccinated

| | Transfer Index | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| pressure | 0.048** | 0.048** | 0.050** | 0.038* |
| | (0.021) | (0.021) | (0.022) | (0.022) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.017 | 0.018 | 0.040 | 0.049 |
| Observations | 378 | 378 | 378 | 378 |

*Notes:* A linear regression of the transfer index (a weighted average of the fraction sent in the DG and in each of the roles in the TG) by whether or not vaccination was due to pressure, with controls added gradually, and only for the partially vaccinated (those who received 1 or 2 vaccination shots). Order refers to whether the DG or TG appeared first in the questionnaire. # of Infections refers to the number of times the individual contracted Covid-19. Socio-demographics include age and dummies for gender, high education, high income, religion (Jewish = 1), being orthodox, and belonging to the political right wing. Trust Moh refers to the degree of trust in the Ministry of Health on a scale of 1–5. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Standard errors in parentheses.

## 7.3 Zooming-in on the Non Vaccinated

While we do not observe the pressure experienced by the non-vaxxers, we do observe the explanations they provided for their decision to forego vaccination. The non-vaxxers were

[20] Indeed, the proportion of partially-vaccinated individuals among those who reported that they vaccinated due to pressure (i.e., reluctantly) is considerably larger than among those who vaccinated but did not report acting due to pressure (38% compared to 18%, respectively). This underscores our interpretation of partial vaccination as an indication of holding an anti-vaccine stance.

[21] Note that we cannot perform this exercise for the fully-vaccinated group or for the non vaccinated. The former includes many pro-vaccine individuals, while for the latter we do not have information on the pressure they experienced because they did not take the vaccine (neither voluntarily nor due to pressure).

**Table 9:** Average Transfers of Non-Vaxxers by Stated Reasons

| | Giving in DG | Player A in TG | Player B in TG | Transfer index |
|---|---|---|---|---|
| Pure anti-vaccine reasons ($n = 157$) | 0.49 | 0.56 | 0.45 | 0.5 |
| Health-related concerns ($n = 34$) | 0.43 | 0.54 | 0.37 | 0.45 |

Notes: The table reports the fractions transferred in the three games and the transfer index for non-vaxxers. The first row reports these fractions for those who indicated at least one of the two explanations that reflect an anti-vaccine sentiment. The second row reports the averages for those who indicated only health-related concerns.

asked to choose at least one of five possible options to explain their decision:

- I was not convinced of the vaccine's effectiveness
- I was not bothered by the risk to contract the virus
- I was concerned about side effects
- Health reasons prevent me from taking the vaccine
- Other (please specify)

The explanations are ordered here by the strength of the anti-vaccine sentiment: The first two explanations clearly express a more anti-vaccine stance ("pure anti-vaccine reasons") compared to the next two, which reflect health-related concerns.[22] Consequently, we can expect the level of convictions (and hence average transfers) to be higher among those who indicated any of the pure anti-vaccine reasons: These individuals clearly made an active choice against the vaccine based on their principles and despite the stigma associated with their decision.[23] Table 9 shows the average levels of transfers of those who cited pure anti-vaccine reasons (the first and second reasons) and those who only cited health-related concerns (the third and fourth reasons). Average transfers are higher for the former group, in-line with the convictions-based explanation.[24]

# 8 Model

In this section we lay out a model that incorporates vaccination bliss points and (extrinsic and intrinsic) costs of vaccination, as well as convictions. The model is able to produce all patterns found in our data. Initially, the only extrinsic cost for not vaccinating is getting

[22] The third explanation (being concerned about side effects) may be thought of as a subjective variant of the fourth one (health reasons that prevent one from taking the vaccine).

[23] In this analysis, we exclude 10 participants who only chose 'Other' since classifying them relies on subjective interpretations of their explanations.

[24] The difference in the average return of player B in the TG is significant at the 5% level but the other differences are not (these statistical tests are not particularly informative and are therefore omitted from the table, as the group that selected the third or fourth reason includes only 34 participants).

stigmatized, corresponding to the analysis of our main pool of participants (Section 4) that excludes those who vaccinated due to workplace or green-pass pressure. This type of pressure (see Section 7.1) is added in the extended model (Section 8.1). Proofs are relegated to Appendix A. While the model is motivated by the vaccination context studied in the data, it captures in essence a more general class of environments in which individuals face pressure to comply with policies they may oppose on principled grounds.

Suppose there are two types of individuals: Those whose bliss point is to get vaccinated (pro-vaccine), making up a fraction $\alpha \in (0,1)$ of the society, and those whose bliss point is to refrain from vaccination (anti-vaccine). The action space consists of two corresponding actions—full vaccination and no vaccination—and a third "compromise" option of getting only partially vaccinated. There are costs associated with choosing each action. First, there is an extrinsic cost $e$ for not getting vaccinated at all, which is multiplied by a factor $\mu \in [0,1)$ when choosing the compromise option of partial vaccination. This cost reflects the stigma associated with not vaccinating, which can be relieved, to some extent, by getting partial vaccination.[25] Second, individuals incur an intrinsic cost $c$ when their chosen action directly contradicts their principles (bliss points). This happens when someone opts for full vaccination despite being anti-vaccine or chooses not to vaccinate despite being pro-vaccine. This intrinsic cost is heterogeneous in the population, and is drawn from a continuous distribution with density $f(c)$ and full support on $R^+$ (whose mean is denoted by $\hat{c}$).[26] In the model, this cost parameter $c$ captures convictions, and we derive our predictions with respect to it. Larger values of $c$ reflect stronger convictions, as they imply higher reluctance to deviate from one's principles. Choosing the compromise solution of partial vaccination involves only a partial deviation from these principles, hence entails a lower cost. Specifically, by choosing partial vaccination, one incurs a cost of $\lambda c$, with $\lambda \in (0,1)$. We assume that the distribution of $c$ is the same for pro-vaccine and anti-vaccine individuals. In other words, there is no correlation between individuals' convictions and their vaccination principles.

Given this cost structure, it is immediate that for all the pro-vaccine individuals it is a dominant strategy to follow their bliss point and fully vaccinate, incurring no cost in the process. Moving on to the anti-vaccine group, below is the loss $L$ associated with each of the choices available to them.

$$L = \begin{cases} e & \text{if receives no vaccination} \\ \mu e + \lambda c & \text{if receives partial vaccination} \\ c & \text{if receives full vaccination} \end{cases} \tag{1}$$

[25] It is straightforward to add a small cost for vaccinating (as long as the cost of not vaccinating remains higher), or to make the cost $e$ heterogeneous in the population. However, it is not necessary to do so in order to capture the essence of the mechanism at work.

[26] The full support requirement is not essential, it simply enables us to state some of our results as strict inequalities rather than weak ones.

For partial vaccination to be chosen by some anti-vaccine individuals in their attempt to minimize $L$, there needs to be a non-empty range of values of $c$ for which $\mu e + \lambda c < \min\{e, c\}$. Since $c$ is continuously distributed over $R^+$, this boils down to requiring that $\frac{\mu}{1-\lambda} e < \frac{1-\mu}{\lambda} e$, so that individuals with $c \in [\frac{\mu}{1-\lambda} e, \frac{1-\mu}{\lambda} e] \equiv [\underline{c}, \bar{c}]$ choose to partially vaccinate. This interval is non empty if and only if

$$\mu + \lambda < 1. \tag{2}$$

A sensible interpretation of condition (2) is that the reduction in the costs associated with partial vaccination—a reduction that is more significant the smaller $\mu$ and $\lambda$ are—is substantial enough to make it worthwhile for some individuals to choose this compromise alternative. To account for the patterns in our data, from now on we assume that inequality (2) holds.

**Lemma 1.** *The action chosen by an anti-vaccine individual depends on their intrinsic cost $c$ as follows.*

$$a = \begin{cases} \textit{fully vaccinate} & \textit{if } c < \underline{c} \\ \textit{partially vaccinate} & \textit{if } c \in [\underline{c}, \bar{c}] \\ \textit{not vaccinate} & \textit{if } c > \bar{c} \end{cases} \tag{3}$$

We are now ready to state the main result of the model.

**Proposition 1.** ***Truncated U-shape***

1. *The average intrinsic cost among the non-vaccinated is larger than among the fully vaccinated and the partially vaccinated.*
2. *If* $\frac{\int_{\underline{c}}^{\bar{c}} c f(c) dc}{\int_{\underline{c}}^{\bar{c}} f(c) dc} < \frac{\alpha \hat{c} + (1-\alpha) \int_0^{\underline{c}} c f(c) dc}{\alpha + (1-\alpha) \int_0^{\underline{c}} f(c) dc}$, *then the average intrinsic cost among the fully vaccinated is larger than among the partially vaccinated.*

Part 1 of the proposition establishes the decreasing part of the truncated U-shape and part 2 establishes its increasing part. The intuition for the proposition is as follows. Among the pro-vaccine individuals everyone fully vaccinates, hence the average intrinsic cost of this group is simply $\hat{c}$. Among the anti-vaccine group, those with high $c$ follow their bliss points and do not vaccinate, those with low $c$ fully vaccinate, and those with an intermediate $c$ partially vaccinate (this downward sloping pattern of intrinsic cost is illustrated in Figure 5 and corresponds to the empirical pattern found among the "admittedly anti vaccine", as presented in Figure 4). Thus, if we compare the average $c$ for each *action*, it will always be highest for the non vaccinated (part 1 of Proposition 1). The comparison of the partially and fully vaccinated relies on the parameter values, but an insightful and easy case to consider is when $\mu = 0$ (while $\lambda \neq 0$), which captures the case where one can entirely eliminate the stigma by partially vaccinating. This value of $\mu$ implies that $\underline{c} = 0$, so that those who are anti-vaccine never fully vaccinate—they either partially vaccinate, if their $c$ is low (smaller than $\bar{c}$), or do not vaccinate, if their $c$ is high. In this case, it is clear that the average $c$ of the partially vaccinated will be smaller than that of the fully vaccinated (whose average $c$ will simply equal the average $c$ in society as they consist only of those with a pro-vaccine stance). This is a special case where the inequality in part 2 of the proposition holds, which, together with part 1, implies the "truncated U-shape" reported in the empirical part. The inequality holds also for larger values of $\mu$, but it also depends on the values of $\alpha$, $\lambda$ and the distribution of $c$ in society.[27] Larger values of $\alpha$ make it more likely that the inequality holds, because they imply that, among the fully vaccinated, there is a smaller share of anti-vaccine individuals (whose $c$ is smaller). While $\alpha$ is not observable in the data, it is likely to indeed be quite substantial in most countries (at least among western societies), where a large part of the population wholeheartedly adopted the official recommendation to get vaccinated. The effect of $\lambda$ is non deterministic: As $\lambda$ increases from 0 to $1 - \mu$, the range $[\underline{c}, \bar{c}]$ shrinks towards the value $c = e$. Depending on the exact shape of $f(c)$, this might make the LHS of the inequality in part 2 of the proposition larger or smaller. Increasing $\lambda$ has an ambiguous effect on the RHS of the inequality too, and depends on the value of $\alpha$.[28]

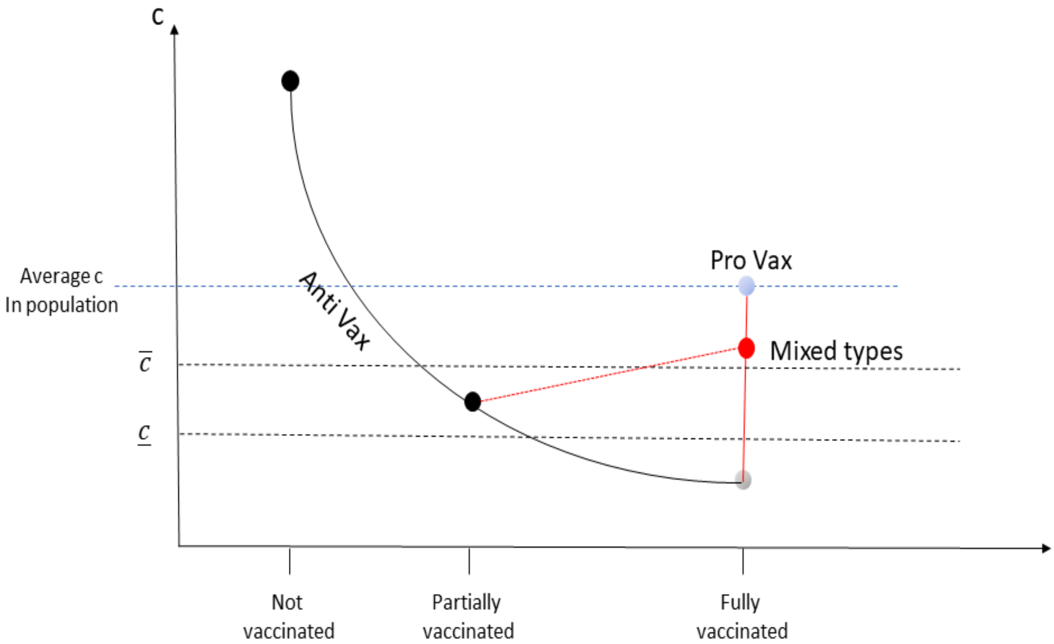
So far, the model assumes that the choice whether to vaccinate, and to what extent, is subject to a trade off between being true to one's vaccination ideal and attempting to avoid being stigmatized. Some anti-vaccine individuals give in to the external cost: The weaker their convictions, the higher is the number of vaccine shots they will eventually take. Consequently, the non vaccinated are bound to have the strongest convictions. Furthermore, under plausible conditions, those who partially vaccinate will have, on average, the weakest convictions, generating a "truncated U-shape" in convictions as a function of the extent of vaccination: A steep decline when moving from no vaccination to partial vaccination, and then a moderate increase when moving from partial vaccination to full vaccination—see the illustration in Figure 5.

This analysis assumes that the costs of remaining non-vaccinated are summarized by the stigma and are the same for everyone. However, we know that some people faced additional pressures and factored them into their vaccination decisions. Therefore, we next extend the model to incorporate two levels of costs, which allows us to capture additional patterns in our data that the basic framework cannot address.

[27] Small values of $\mu$, for which the inequality is most likely to hold, capture "liberal societies" (see Michaeli and Spiro, 2015), where small deviations from the social norm are only lightly sanctioned.

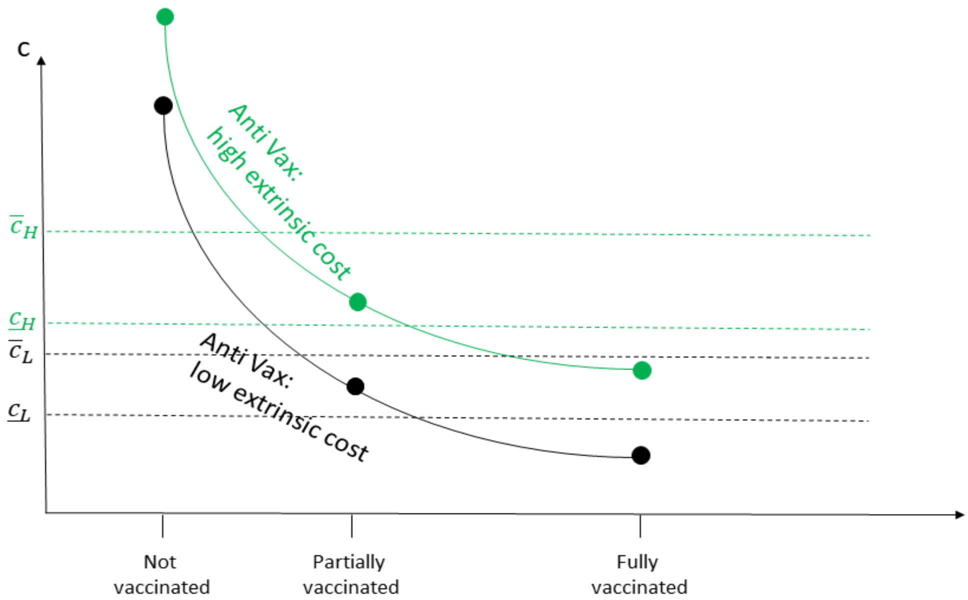
[28] It is easy to verify that when $\lambda \to 0$, the inequality in part 2 of the proposition does not hold. This is because in this case the option of no vaccination is dominated by partial vaccination for any finite $c$, and so the partially vaccinated have average convictions above the average in society, hence above that of the fully vaccinated. However, this case clearly does not correspond to the empirical evidence, because we do see in the data a non negligible number of non vaxxers. Thus, the empirical evidence and the model's logic jointly require that $\lambda$ is not close to zero. This implies that people are, at least to some extent, *perfectionist*, i.e., sensitive to small deviations from their bliss point, in line with previous findings in the literature (Kendall et al., 2015; Chen et al., 2023).

**Figure 5:** Average Intrinsic Cost by Vaccination Status - Basic Model




The figure illustrates the average intrinsic cost, i.e., the strength of convictions, as a function of vaccination status. The condition in part 2 of Proposition 1 ensures that the black dot that corresponds to the average intrinsic cost of the partially-vaccinated group is lower than the red dot on the right that represents the average intrinsic cost of the mixed types who fully vaccinate. The figure illustrates that this happens if the fraction of pro-vaccine individuals in society ($\alpha$) is sufficiently large.

**Figure 6:** Average Intrinsic Cost by Vaccination Status for Anti-vaccine Individuals under Two Levels of Extrinsic Cost




### 8.1 An Extension: Two Levels of Extrinsic Cost

Suppose now that there are two possible levels of extrinsic cost for remaining non-vaccinated: $e_L$ (Low) and $e_H$ (High), s.t. $e_L < e_H$. We interpret $e_L$ as the cost of the stigma associated with not vaccinating, while $e_H$ includes an additional cost on top of the stigma. This additional cost can reflect workplace and/or green-pass restrictions that certain individuals face if they opt not to vaccinate. The level of extrinsic cost faced by an individual is assumed to be orthogonal to the individual's bliss point and to their intrinsic cost $c$, with a fraction $\beta \in (0, 1)$ of the individuals facing the low cost. Denote $\underline{c}_L \equiv \frac{\mu}{1-\lambda} e_L$, $\underline{c}_H \equiv \frac{\mu}{1-\lambda} e_H$, $\bar{c}_L \equiv \frac{1-\mu}{\lambda} e_L$ and $\bar{c}_H \equiv \frac{1-\mu}{\lambda} e_H$. Then Lemma 1 holds for anti-vaccine individuals facing $e_L$ with $\underline{c} = \underline{c}_L$ and $\bar{c} = \bar{c}_L$, and for anti-vaccine individuals facing $e_H$ with $\underline{c} = \underline{c}_H$ and $\bar{c} = \bar{c}_H$.

This straightforward extension of the model enables us to derive two additional predictions which we tested using our data. First, the downward-sloping pattern of intrinsic costs as a function of vaccination status for anti-vaccine individuals, as implied by Lemma 1, should hold within each level of extrinsic cost, i.e., for each of the pairs $(\underline{c}_L, \bar{c}_L)$, $(\underline{c}_H, \bar{c}_H)$, as illustrated in Figure 6. Indeed, this pattern is shown to hold in our data for individuals facing the high extrinsic cost, as visualized in Figure 4 in Section 7.1.[29]

[29] As previously discussed, anti-vaccine individuals facing a low extrinsic cost who chose to fully vaccinate cannot be distinguished from pro-vaccine individuals, meaning that the downward-sloping pattern for those who faced a low external cost cannot be observed in the data.

With the extended model we can also make predictions comparing the intrinsic costs of anti-vaccine individuals with the same vaccination status who faced different extrinsic costs. Holding the vaccination status fixed, the model predicts higher average intrinsic cost for those who faced the high extrinsic cost compared to those who faced the low extrinsic cost, as one would naturally expect. This prediction is illustrated in Figure 6 and is shown to hold in our data for the partially-vaccinated group in Section 7.2.[30]

## 9 Summary and Conclusion

Utilizing a large representative sample of the Israeli adult population, approached in the latter stages of the Covid-19 pandemic, we find that non-vaxxers show higher levels of pro-sociality than vaxxers. Looking more closely, we uncover a truncated U-shape pattern of pro-sociality as a function of vaccination status: Non-vaxxers exhibit the highest levels, partially vaccinated individuals show the lowest, while the fully vaccinated fall in-between. We explore a handful of potential explanations and rule out all but one. The remaining explanation hinges on the idea that in both the vaccination domain, as well as in the experimental games, choices reflect not only views and principles, but also one's willingness to incur costs in order to abide by these principles. We refer to this willingness as the individual's strength of convictions, or simply convictions.

We believe that our findings provide an insight to an important feature of human behavior and to how social judgments are formed under policy pressure. In many contexts where governments seek to promote behavior viewed as socially beneficial, individuals who do not comply are often judged negatively and accused of lacking concern for others. Yet, the grounds for non-compliance may be rooted in deeply held principles and a willingness to incur personal costs to adhere to them rather than low pro-sociality. These contexts include refusal to participate in mandatory military or civil service, or non-compliance with tax requirements under highly controversial regimes. Taken together, these examples suggest that when individuals oppose policies on principled grounds, non-compliance need not reflect low pro-sociality, but may instead indicate strong convictions and a willingness to incur personal costs to adhere to them.

[30] Footnote 21 explains why this comparison can be performed empirically only for the partially vaccinated group.

## References


Achtziger, A., C. Alós-Ferrer, and A. K. Wagner (2015): "Money, depletion, and prosociality in the dictator game." *Journal of Neuroscience, Psychology, and Economics*, 8, 1.

Aghion, P., Y. Algan, P. Cahuc, and A. Shleifer (2010): "Regulation and distrust," *The Quarterly journal of economics*, 125, 1015–1049.

Ahmed, A. M. and O. Salas (2011): "Implicit influences of Christian religious representations on dictator and prisoner's dilemma game decisions," *The Journal of Socio-Economics*, 40, 242–246.

Ajzen, I. (1991): "The theory of planned behavior," *Organizational behavior and human decision processes*, 50, 179–211.

Ajzen, I. and M. Fishbein (1977): "Attitude-behavior relations: A theoretical analysis and review of empirical research." *Psychological bulletin*, 84, 888.

Barrios, J. M., E. Benmelech, Y. V. Hochberg, P. Sapienza, and L. Zingales (2021): "Civic capital and social distancing during the Covid-19 pandemic," *Journal of public economics*, 193, 104310.

Bartscher, A. K., S. Seitz, S. Siegloch, M. Slotwinski, and N. Wehrhöfer (2021): "Social capital and the spread of Covid-19: Insights from European countries," *Journal of health economics*, 80, 102531.

Bašić, Z. and E. Verrina (2024): "Personal norms—and not only social norms—shape economic behavior," *Journal of Public Economics*, 239, 105255.

Basili, M., A. Muscillo, and P. Pin (2022): "No-vaxxers are different in public good games," *Scientific Reports*, 12, 18132.

Ben-Ner, A., F. Kong, and L. Putterman (2004): "Share and share alike? Gender-pairing, personality, and cognitive ability as determinants of giving," *Journal of Economic Psychology*, 25, 581–589.

Bicchieri, C., E. Xiao, and R. Muldoon (2011): "Trustworthiness is a social norm, but trusting is not," *Politics, Philosophy & Economics*, 10, 170–187.

Campos-Mercade, P., A. N. Meier, F. H. Schneider, and E. Wengström (2021): "Prosociality predicts health behaviors during the COVID-19 pandemic," *Journal of public economics*, 195, 104367.

Cappelen, A. W., A. D. Hole, E. Ø. Sørensen, and B. Tungodden (2007): "The pluralism of fairness ideals: An experimental approach," *American Economic Review*, 97, 818–827.

Cappelen, A. W., Y. Liu, H. Nielsen, and B. Tungodden (2024): "Fairness in a Society of Unequal Opportunities," .

Capraro, V. and D. G. Rand (2018): "Do the right thing: Experimental evidence that preferences for moral behavior, rather than equity or efficiency per se, drive human prosociality," *Judgment and Decision Making*, 13, 99–111.

Carlin, B. I., F. Dorobantu, and S. Viswanathan (2009): "Public trust, the law, and financial investment," *Journal of Financial Economics*, 92, 321–341.

Catola, M., S. D'Alessandro, P. Guarnieri, and V. Pizziol (2021): "Personal norms in the online public good game," *Economics Letters*, 207, 110024.

Chapman, J., M. Dean, P. Ortoleva, E. Snowberg, and C. Camerer (2023): "Econographics," *Journal of Political Economy Microeconomics*, 1, 115–161.

Charness, G., E. Haruvy, and D. Sonsino (2007): "Social distance and reciprocity: An Internet experiment," *Journal of economic behavior & organization*, 63, 88–103.

Chen, C.-C., I.-M. Chiu, J. Smith, and T. Yamada (2013): "Too smart to be selfish? Measures of cognitive ability, social preferences, and consistency," *Journal of Economic Behavior & Organization*, 90, 112–122.

Chen, D. L., M. Michaeli, and D. Spiro (2023): "Non-confrontational extremists," *European Economic Review*, 157, 104521.

Dunning, D., J. E. Anderson, T. Schlösser, D. Ehlebracht, and D. Fetchenhauer (2014): "Trust at zero acquaintance: more a matter of respect than expectation of reward." *Journal of Personality and Social Psychology*, 107, 122.

Elinder, M., O. Erixson, and M. Öhman (2023): "Cognitive ability, health policy, and the dynamics of COVID-19 vaccination," *Journal of Health Economics*, 91, 102802.

Engel, C. (2011): "Dictator games: A meta study," *Experimental economics*, 14, 583–610.

Everett, J. A., O. S. Haque, and D. G. Rand (2016): "How good is the Samaritan, and why? An experimental investigation of the extent and nature of religious prosociality using economic games," *Social Psychological and Personality Science*, 7, 248–255.

Falk, A., A. Becker, T. Dohmen, D. Huffman, and U. Sunde (2023): "The preference survey module: A validated instrument for measuring risk, time, and social preferences," *Management Science*, 69, 1935–1950.

Fang, X., T. Freyer, C.-Y. Ho, Z. Chen, and L. Goette (2022): "Prosociality predicts individual behavior and collective outcomes in the COVID-19 pandemic," *Social Science & Medicine*, 308, 115192.

Fiedler, M. and E. Haruvy (2009): "The lab versus the virtual lab and virtual field—An experimental investigation of trust games with communication," *Journal of Economic Behavior & Organization*, 72, 716–724.

Fobiwe, J. P., P. Martus, B. D. Poole, J. L. Jensen, and S. Joos (2022): "Influences on Attitudes Regarding COVID-19 Vaccination in Germany," *Vaccines*, 10, 658.

Forsythe, R., J. L. Horowitz, N. E. Savin, and M. Sefton (1994): "Fairness in simple bargaining experiments," *Games and Economic behavior*, 6, 347–369.

Ghani, W. A. W. A. K., I. F. Rusli, D. R. A. Biak, and A. Idris (2013): "An application of the theory of planned behaviour to study the influencing factors of participation in source separation of food waste," *Waste management*, 33, 1276–1281.

Gilg, A. and S. Barr (2006): "Behavioural attitudes towards water saving? Evidence from a study of environmental actions," *Ecological Economics*, 57, 400–414.

Goldstein, D. A. and J. Wiedemann (2022): "Who do you trust? The consequences of partisanship and trust for public responsiveness to COVID-19 orders," *Perspectives on Politics*, 20, 412–438.

Guerra, A. and B. Harrington (2018): "Attitude–behavior consistency in tax compliance: A cross-national comparison," *Journal of Economic Behavior & Organization*, 156, 184–205.

Han, R., J. Shi, W. Yong, and W. Wang (2012): "Intelligence and prosocial behavior: Do smart children really act nice?" *Current psychology*, 31, 88–101.

Hussain, B., A. Latif, S. Timmons, K. Nkhoma, and L. B. Nellums (2022): "Overcoming COVID-19 vaccine hesitancy among ethnic minorities: A systematic review of UK studies," *Vaccine*, 40, 3413–3432.

Kendall, C., T. Nannicini, and F. Trebbi (2015): "How do voters respond to information? Evidence from a randomized campaign," *American Economic Review*, 105, 322–353.

Khubchandani, J., S. Sharma, J. H. Price, M. J. Wiblishauser, M. Sharma, and F. J. Webb (2021): "COVID-19 vaccination hesitancy in the United States: a rapid national assessment," *Journal of community health*, 46, 270–277.

Kurschilgen, M. (2023): "Moral awareness polarizes people's fairness judgments," *Social Choice and Welfare*, 1–26.

Malik, A. A., S. M. McFadden, J. Elharake, and S. B. Omer (2020): "Determinants of COVID-19 vaccine acceptance in the US," *EClinicalMedicine*, 26.

Michaeli, M. and D. Spiro (2015): "Norm conformity across societies," *Journal of public economics*, 132, 51–65.

Musa, S., S. Cilovic-Lagarija, A. Kavazovic, N. Bosankic-Cmajcanin, A. Stefanelli, N. A. Scott, M. Scherzer, Z. Kiss, and K. Bach Habersaat (2022): "COVID-19 risk perception, trust in institutions and negative affect drive positive COVID-19 vaccine intentions," *International Journal of Public Health*, 67, 1604231.

Naef, M. and J. Schupp (2009): "Can we trust the trust game? A comprehensive examination," *Royal Holloway College, Discussion Paper Series*, 5.

Norenzayan, A. and A. F. Shariff (2008): "The origin and evolution of religious prosociality," *science*, 322, 58–62.

Peng, Y. (2022): "Politics of COVID-19 vaccine mandates: Left/right-wing authoritarianism, social dominance orientation, and libertarianism," *Personality and individual differences*, 194, 111661.

Puri, N., E. A. Coomes, H. Haghbayan, and K. Gunaratne (2020): "Social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases," *Human vaccines & immunotherapeutics*, 16, 2586–2593.

Razai, M. S., T. Osama, D. G. McKechnie, and A. Majeed (2021): "Covid-19 vaccine hesitancy among ethnic minority groups," *bmj*, 372.

Reddinger, J. L., G. Charness, and D. Levine (2024): "Vaccination as personal public-good provision," *Journal of Economic Behavior & Organization*, 224, 481–499.

Robinson, E., A. Jones, and M. Daly (2021): "International estimates of intended uptake and refusal of COVID-19 vaccines: A rapid systematic review and meta-analysis of large nationally representative samples," *Vaccine*, 39, 2024–2034.

Sasaki, S. and H. Kurokawa (2022): "Vaccination and discrimination: Experimental evidence under the COVID-19 pandemic," *Available at SSRN 4246154*.

Shariff, A. F. and A. Norenzayan (2007): "God is watching you: Priming God concepts increases prosocial behavior in an anonymous economic game," *Psychological science*, 18, 803–809.

Siegrist, M. and A. Bearth (2021): "Worldviews, trust, and risk perceptions shape public acceptance of COVID-19 public health measures," *Proceedings of the National Academy of Sciences*, 118, e2100411118.

Sosis, R. and B. J. Ruffle (2004): "Ideology, religion, and the evolution of cooperation: Field experiments on Israeli Kibbutzim," in *Socioeconomic aspects of human behavioral ecology*, Emerald Group Publishing Limited, vol. 23, 89–117.

Sternberg, H., J. I. Steinert, and T. Büthe (2024): "Compliance in the public versus the private realm: Economic preferences, institutional trust and COVID-19 health behaviors," *Health Economics*.

Tabellini, G. (2008a): "Institutions and culture," *Journal of the European Economic association*, 6, 255–294.

——— (2008b): "The scope of cooperation: Values and incentives," *The Quarterly Journal of Economics*, 123, 905–950.

——— (2010): "Culture and institutions: economic development in the regions of Europe," *Journal of the European Economic association*, 8, 677–716.

Umer, H. (2020): "Revisiting generosity in the dictator game: Experimental evidence from Pakistan," *Journal of Behavioral and Experimental Economics*, 84, 101503.

Wilson, S. L. and C. Wiysonge (2020): "Social media and vaccine hesitancy," *BMJ global health*, 5, e004206.

Wintrobe, R. et al. (1995): "Some economics of ethnic capital formation and conflict," *Nationalism and rationality*, 43–70.

Wollebæk, D., A. Fladmoe, K. Steen-Johnsen, and Ø. Ihlen (2022): "Right-wing ideological constraint and vaccine refusal: The case of the COVID-19 vaccine in Norway," *Scandinavian Political Studies*, 45, 253–278.

Wolters, E. A. (2014): "Attitude–behavior consistency in household water consumption," *The Social Science Journal*, 51, 455–463.

Xygalatas, D. and L. Martin (2016): "Prosociality and religion," in *Mental religion*, Macmillan Reference USA, 119–133.

# A Proofs

## A.1 Proof of Lemma 1

The optimal choice of an individual given their $c$ follows immediately from equation (1), which states the disutility associated with each vaccination choice, while assuming that the inequality in equation (2) holds.[31]

## A.2 Proof of Proposition 1

**Part 1**

First note that all pro-vaccine individuals fully vaccinate, while anti-vaccine individuals choose according to the rule specified in Lemma 1. Therefore, the average intrinsic cost among the non-vaccinated group is the average of $\{c|c > \bar{c}\}$. This value is of course larger than the average of $\{c|\underline{c} < c < \bar{c}\}$, which is the average intrinsic cost among the partially vaccinated. Furthermore, the former is larger than $\hat{c}$, the average $c$ in the entire society (owing to averaging only over values above $\bar{c}$), which itself is larger than the average $c$ among the fully vaccinated. This is so because the group of fully vaccinated is composed of all pro-vaccine individuals (whose average $c$ is $\hat{c}$) and of anti-vaccine individuals with $c < \underline{c}$, who pull the average $c$ of this group downwards.

**Part 2**

The LHS of the inequality in this part of the proposition is the average intrinsic cost among the partially vaccinated, while the RHS is the average intrinsic cost among the fully vaccinated. To see why the RHS is the average $c$ among the fully vaccinated, note that the group of fully vaccinated consists of pro-vaccine individuals, whose fraction in society is $\alpha$ and average $c$ is $\hat{c}$, and anti-vaccine individuals with an intrinsic cost $c$ that is lower than $\underline{c}$, whose fraction in society is $(1-\alpha)\int_0^{\underline{c}} f(c)dc$ (due to the independence between $c$ and the attitude towards vaccination) and conditional mean of $c$ is $\int_0^{\underline{c}} cf(c)dc / \int_0^{\underline{c}} f(c)dc$.

# B Additional Analyses

The first two subsections provide the results and tables that appear in Sections 4.2-4.4 using:

- The full sample with the same classification into vaxxers and non-vaxxers used in the main text. That is, we include those who cited health reasons as their only reason for not vaccinating and those who reported vaccinating due to work or green-pass pressure.

[31] If equation (2) does not hold, the individual either fully vaccinates (if $c < e$) or refrains from vaccinating (if $e < c$).

- MoH Classification: A slightly different categorization that classifies individuals into "vaxxers," "non-vaxxers" and "indeterminate" by criteria established by the Ministry of Health. These criteria take into consideration the required number of vaccine doses relative to the number of infections. According to this categorization fully vaccinated individuals (Vaxxers) consist of those who received three doses or more together with those who vaccinated twice and were infected by Covid-19 at least twice. The indeterminate group consists of individuals who received only one dose and individuals who received two doses but were infected at most once. These individuals may have been considered not fully vaccinated for some period of time by the MoH. This categorization was specified in our pre-registration. As preregistered, some analyses exclude the indeterminate group.

The third subsection provides additional pre-registered analyses. The final subsection replicates Table 7 for each pro-sociality measure and also reports a logit regression of Table 2.

## B.1 Overview of Pro-Sociality and Vaccination: Entire Sample and MoH Classification

Table B1 reports the t-statistics and corresponding $p$-values for each measure using for the full sample. Results are very similar to those in the main text. Results of the Wilcoxon-Mann-Whitney tests are also very similar to those reported in the main text with $p < 0.0055$ for all measures. Table B2 reports the t-tests and corresponding $p$-values for the vaxxer and non-vaxxer group according to the MoH classification with the full sample. The Wilcoxon-Mann-Whitney tests give similar results to the t-tests with $p < 0.0089$ for all measures. Table B3 reports the t-tests and corresponding $p$-values for the vaxxer and non-vaxxer group according to the MoH classification using the restricted sample (i.e., without non-vaxxers who reported health reasons as their sole justification for not vaccinating and without those who reported vaccinating due to pressure). Once again, the Wilcoxon-Mann-Whitney tests give similar results to the t-tests with $p < 0.0041$ for all measures.[32] and according to both the t-tests and the Wilcoxon-Mann-Whitney tests ($p < 0.001$ for both tests and according to both the MoH classification and the classification used in the main text). Since it is not part of our main interest, it is not reported in the tables. In the pre-registration we also specified another classification that is based on the MoH classification but finer: (*i*) non vaxxers, (*ii*) vaxxers (according to the MoH classification) who reported pressure (either green-pass or workplace), and (*iii*) vaxxers (according to the MoH classification) who did not report pressure.[33] For this categorization

[32]The level of trust in the Ministry of Health is statistically significantly higher for the vaxxers than for the non-vaxxers according to all classifications, both for the restricted and the non-restricted sample,

[33]We specified a potential fourth category of non-vaxxers who reported a health reason as their sole justification for not getting vaccinated. However, this category comprises less than 5% of the sample (only 9 participants), and so according to the pre-registration, we grouped them together with the other non-vaxxers.

we ran an Analysis of Variance for each measure (and for the level of trust in the Ministry of Health) and found that we can reject the null hypothesis according to which our measures are independent of the category ($p < 0.0037$ for all measures).[34]

**Table B1:** Averages of Vaxxers and non-Vaxxers in the DG and TG: Full Sample

| | Vaxxers ($n$=1361) | non-Vaxxers ($n$=201) | t-statistic | p-value |
|---|---|---|---|---|
| Average Giving in DG | 0.432 | 0.49 | 3.025 | = 0.0025 |
| Average Transfers in TG (Player A) | 0.49 | 0.558 | 3.403 | < 0.001 |
| Average Returned in TG (Player B) | 0.381 | 0.443 | 4.074 | < 0.001 |

**Table B2:** Averages of Vaxxers and non-Vaxxers in the DG and TG: MoH Classification (Full Sample)

| | Vaxxers ($n$=1,031) | non-Vaxxers ($n$=201) | t-statistic | p-value |
|---|---|---|---|---|
| Average Giving in DG | 0.431 | 0.49 | 3.004 | 0.0027 |
| Average Transfers in TG (Player A) | 0.493 | 0.558 | 3.183 | 0.0015 |
| Average Returned in TG (Player B) | 0.381 | 0.443 | 4.001 | < 0.001 |

**Table B3:** Averages of Vaxxers and non-Vaxxers in the DG and TG: MoH Classification (Restricted Sample)

| | Vaxxers ($n$=596) | non-Vaxxers ($n$=192) | t-statistic | p-value |
|---|---|---|---|---|
| Average Giving in DG | 0.419 | 0.492 | 3.348 | < 0.001 |
| Average Transfers in TG (Player A) | 0.486 | 0.561 | 3.359 | < 0.001 |
| Average Returned in TG (Player B) | 0.383 | 0.446 | 3.705 | < 0.001 |

[34]Post-hoc analyses largely show that the differences are between non-vaxxers and both categories of vaccinated individuals, rather than between the two subsets of vaccinated individuals themselves. This resonates the more detailed analyses presented in the main text, where we attribute the latter result to the composition of the group of vaxxers who did not report vaccinating due to pressure (which comprises both pro-vaccine individuals, with varying levels of convictions, and anti-vaccine individuals, with weak convictions). Consequently, and in order to conserve space, we do not include the tables with the post-hoc analyses, but they are available upon request.

## B.2 Regressions: Entire Sample and MoH Classification

In this subsection we report the same regressions that appeared in the main text (Tables 4, 5, and 6) but we do so for the entire sample, i.e., without excluding anyone based on reasons for vaccinating/not vaccinating (Tables B4, B5, and B6). We also run the same regressions using the MoH classification while excluding the indeterminate group (Tables B7, B8, and B9).

**Table B4:** Giving in DG by Vaccination: Full Sample

| | Fraction Given | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer | -0.059*** | -0.058*** | -0.048** | -0.045** |
| | (0.021) | (0.021) | (0.021) | (0.022) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.006 | 0.007 | 0.014 | 0.015 |
| Observations | 1562 | 1562 | 1562 | 1562 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B5:** Transfers in TG (Player A) by Vaccination: Full Sample

| | Fraction Transferred | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer | -0.068*** | -0.068*** | -0.060*** | -0.054** |
| | (0.022) | (0.022) | (0.022) | (0.023) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.008 | 0.008 | 0.021 | 0.022 |
| Observations | 1562 | 1562 | 1562 | 1562 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B6:** Average Returns in TG (Player B) by Vaccination: Full Sample

| | Average Fraction Returned | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer | -0.064*** | -0.063*** | -0.064*** | -0.059*** |
| | (0.017) | (0.017) | (0.017) | (0.018) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.015 | 0.015 | 0.020 | 0.020 |
| Observations | 1562 | 1562 | 1562 | 1562 |

Notes: $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.
Standard errors in parenthesis.

**Table B7:** Giving in DG by Vaccination: MoH Classification (without indeterminate group)

| | Fraction Given | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer (MoH Classifcation) | -0.060*** | -0.058*** | -0.045** | -0.044* |
| | (0.021) | (0.021) | (0.022) | (0.024) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.008 | 0.009 | 0.017 | 0.017 |
| Observations | 1232 | 1232 | 1232 | 1232 |

Notes: $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.
Standard errors in parenthesis.

**Table B8:** Transfers in TG (Player A) by Vaccination: MoH Classification (without indeterminate group)

| | Fraction Transferred | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer (MoH Classifcation) | -0.065*** | -0.066*** | -0.054** | -0.054** |
| | (0.022) | (0.023) | (0.023) | (0.025) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.008 | 0.008 | 0.024 | 0.024 |
| Observations | 1232 | 1232 | 1232 | 1232 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B9:** Average Returns in TG (Player B) by Vaccination: MoH Classification (without indeterminate group)

| | Average Fraction Returned | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Vaxxer (MoH Classifcation) | -0.063*** | -0.064*** | -0.063*** | -0.061*** |
| | (0.017) | (0.017) | (0.018) | (0.019) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.016 | 0.016 | 0.022 | 0.022 |
| Observations | 1232 | 1232 | 1232 | 1232 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

## B.3 Additional Analyses Specified in the Pre-Registered Analysis Plan

We report the results of analyzing the data while flipping the axes, i.e., when the dependent variable is the number of vaccinations (where those who vaccinated 3 or more times are grouped together and considered as if they vaccinated 3 times) and the independent variables are the fractions transferred according to our three measures. This is the specification that appears in the pre-registered analysis plan and, as can be seen below, leads to similar conclusions as the analysis in the main text in terms of the overall correlations between transfers and vaccination decisions.[35] Tables B10, B11, and B12 report the results of these

[35] In the main text, we chose to present the correlation in the reverse order of dependent/independent variables, in order to highlight the convictions-based mechanism.

regressions excluding those who vaccinated due to (workplace and green-pass) pressure and those who did not vaccinate due to health reasons.[36]. Tables B13, B14, and B15 report the results of the same regressions for the entire sample. The controls are the same as those in the main text along with social media and the alternative-lifestyle variables (as specified in our pre-registered analysis plan).[37] As in the analysis in the main text, we can see that higher transfers are associated with a lower number of vaccinations. Notice that the correlations are slightly weaker than in the main text. The reason is that, as we already know, the relationship between the number of vaccinations and transfers in the experimental games is non-monotonic. Nonetheless, the overall correlation reported in Tables 4, 5, and 6 is strong enough to show up even when flipping the axes and considering the entire range of vaccinations.[38]

**Table B10:** Numbers of Vaccinations by Giving in DG

| | Number of Vaccinations (0-3) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Fraction Given | -0.483*** | -0.443*** | -0.319** | -0.114 |
| | (0.158) | (0.155) | (0.143) | (0.127) |
| Order | No | No | No | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust in MoH | No | No | No | Yes |
| Social Media | No | No | No | Yes |
| Alternative Lifestyle | No | No | No | Yes |
| $R^2$ | 0.011 | 0.043 | 0.199 | 0.392 |
| Observations | 900 | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

[36]P-values adjusted for multiple comparisons using the Romano-Wolf correction appear in Table B23

[37]The order in which we add the controls is also according to the pre-registered analysis plan.

[38]We also ran these regressions with the level of trust in the MoH as the independent variable. All specifications show a strong and significant positive correlation between the level of Trust in MoH and and the number of vaccinations. Since this was not part of our main interest in the paper, these tables are omitted to conserve space.

**Table B11:** Numbers of Vaccinations by Transfers in TG (Player A)

| | Number of Vaccinations (0-3) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Fraction Transferred | -0.438*** | -0.432*** | -0.272* | -0.119 |
| | (0.157) | (0.156) | (0.143) | (0.123) |
| Order | No | No | No | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust in MoH | No | No | No | Yes |
| Social Media | No | No | No | Yes |
| Alternative Lifestyle | No | No | No | Yes |
| $R^2$ | 0.010 | 0.043 | 0.198 | 0.392 |
| Observations | 900 | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B12:** Numbers of Vaccinations by Average Returns in TG (Player B)

| | Number of Vaccinations (0-3) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Avg. Fraction Returned | -0.726*** | -0.708*** | -0.623*** | -0.338* |
| | (0.203) | (0.202) | (0.186) | (0.173) |
| Order | No | No | No | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust in MoH | No | No | No | Yes |
| Social Media | No | No | No | Yes |
| Alternative Lifestyle | No | No | No | Yes |
| $R^2$ | 0.015 | 0.048 | 0.205 | 0.395 |
| Observations | 900 | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B13:** Numbers of Vaccinations by Giving in DG: Full Sample

| | Number of Vaccinations (0-3) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Fraction Given | -0.315*** | -0.292*** | -0.205** | -0.113 |
| | (0.109) | (0.107) | (0.104) | (0.098) |
| Order | No | No | No | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust in MoH | No | No | No | Yes |
| Social Media | No | No | No | Yes |
| Alternative Lifestyle | No | No | No | Yes |
| $R^2$ | 0.006 | 0.039 | 0.132 | 0.244 |
| Observations | 1562 | 1562 | 1562 | 1562 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B14:** Numbers of Vaccinations by Transfers in TG (Player A): Full Sample

| | Number of Vaccinations (0-3) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Fraction Transferred | -0.292*** | -0.290*** | -0.207** | -0.113 |
| | (0.108) | (0.107) | (0.101) | (0.093) |
| Order | No | No | No | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust in MoH | No | No | No | Yes |
| Social Media | No | No | No | Yes |
| Alternative Lifestyle | No | No | No | Yes |
| $R^2$ | 0.005 | 0.040 | 0.132 | 0.244 |
| Observations | 1562 | 1562 | 1562 | 1562 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B15:** Numbers of Vaccinations by Average Returns in TG (Player B): Full Sample

| | Number of Vaccinations (0-3) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Avg. Fraction Returned | -0.531*** | -0.522*** | -0.489*** | -0.338*** |
| | (0.137) | (0.136) | (0.130) | (0.123) |
| Order | No | No | No | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes |
| Trust in MoH | No | No | No | Yes |
| Social Media | No | No | No | Yes |
| Alternative Lifestyle | No | No | No | Yes |
| $R^2$ | 0.011 | 0.045 | 0.139 | 0.248 |
| Observations | 1562 | 1562 | 1562 | 1562 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

As a final robustness check (that appeared in our pre-registered analysis plan), we consider the categorization according to the criteria of the Ministry of Health without excluding the indeterminate group. In order to include them in the analysis, we specify a multi-nomial logit model where the dependent variable is the category (vaxxer, non-vaxxer, or indeterminate) and the independent variables are the transfers.[39] Tables B16, B17 and B18 report the regression results for the restricted sample (i.e., when excluding those who reported vaccinating due to pressure or a health reason for not vaccinating), while Tables B19, B20 and B21 report the results for the entire sample. In these regressions we do not include the number of infections as an explanatory variable since it is already taken into account in the classification of the vaccination status according to the criteria of the MoH. As can be seen from the tables, high transfers are associated with a higher likelihood of being a non-vaxxer (the omitted group, coded as zero).[40]

Finally, Tables B22 and B23 report adjusted $p-$values (alongside the original $p-$values) for the main explanatory variables in Tables 4-6, and Tables B10-B12, respectively. The adjusted values follow the Romano-Wolf correction specified in the pre-registered analysis plan.

[39] In the analysis plan we specified an ordered logit model. However, after observing the non-monotonic patterns between number of vaccinations and transfers, we think that a more general multi-nomial logit is more fitting in this case.

[40] Once again, we do not include here the regressions for the level of Trust in MoH. As expected, these regressions show that the likelihood to belong to the indeterminate group or the vaxxer group significantly increases as the level of Trust in MoH increases.

**Table B16:** Vaccination by Giving in DG: MoH Classification (Restricted Sample) - Multi-nomial Logit

| | Vaccination Category (MoH)) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| 1 (Indeterminate) | | | |
| Fraction Given | -1.205*** | -1.146** | -0.895* |
| | (0.465) | (0.471) | (0.534) |
| 2 (Vaxxer) | | | |
| Fraction Given | -1.042*** | -0.857** | -0.493 |
| | (0.321) | (0.346) | (0.437) |
| Order | No | No | Yes |
| Socio-Demographics | No | Yes | Yes |
| Trust in MoH | No | No | Yes |
| Social Media | No | No | Yes |
| Alternative Lifestyle | No | No | Yes |
| Pseudo $R^2$ | 0.008 | 0.116 | 0.269 |
| Observations | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B17:** Vaccination by Transfers in TG (Player A): MoH Classification (Restricted Sample) - Multi-nomial Logit

| | Vaccination Category (MoH) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| 1 (Indeterminate) | | | |
| Fraction Transferred | -1.728*** | -1.569*** | -1.193** |
| | (0.469) | (0.465) | (0.521) |
| 2 (Vaxxer) | | | |
| Fraction Transferred | -1.003*** | -0.660* | -0.207 |
| | (0.313) | (0.341) | (0.414) |
| Order | No | No | Yes |
| Socio-Demographics | No | Yes | Yes |
| Trust in MoH | No | No | Yes |
| Social Media | No | No | Yes |
| Alternative Lifestyle | No | No | Yes |
| Pseudo $R^2$ | 0.011 | 0.118 | 0.272 |
| Observations | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B18:** Vaccination by Average Returns in TG (Player B): MoH Classification (Restricted Sample) - Multi-nomial Logit

| | Vaccination Category (MoH) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| 1 (Indeterminate) | | | |
| Avg. Fraction Returned | -1.814*** | -1.710*** | -1.010 |
| | (0.631) | (0.622) | (0.685) |
| 2 (Vaxxer) | | | |
| Avg. Fraction Returned | -1.417*** | -1.327*** | -0.570 |
| | (0.392) | (0.434) | (0.569) |
| Order | No | No | Yes |
| Socio-Demographics | No | Yes | Yes |
| Trust in MoH | No | No | Yes |
| Social Media | No | No | Yes |
| Alternative Lifestyle | No | No | Yes |
| Pseudo $R^2$ | 0.010 | 0.118 | 0.269 |
| Observations | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B19:** Vaccination by Giving in DG): MoH Classification (Full Sample) - Multi-nomial Logit

| | Vaccination Category (MoH) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| 1 (Indeterminate) | | | |
| Fraction Given | -0.827** | -0.751** | -0.536 |
| | (0.357) | (0.351) | (0.392) |
| 2 (Vaxxer) | | | |
| Fraction Given | -0.892*** | -0.682** | -0.418 |
| | (0.312) | (0.320) | (0.370) |
| Order | No | No | Yes |
| Socio-Demographics | No | Yes | Yes |
| Trust in MoH | No | No | Yes |
| Social Media | No | No | Yes |
| Alternative Lifestyle | No | No | Yes |
| Pseudo $R^2$ | 0.003 | 0.068 | 0.144 |
| Observations | 1562 | 1562 | 1562 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B20:** Vaccination by Transfers in TG (Player A): MoH Classification (Full Sample) - Multi-nomial Logit

| | Vaccination Category (MoH) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| 1 (Indeterminate) | | | |
| Fraction Transferred | -1.072*** | -1.059*** | -0.767** |
| | (0.351) | (0.349) | (0.369) |
| 2 (Vaxxer) | | | |
| Fraction Transferred | -0.906*** | -0.716** | -0.364 |
| | (0.305) | (0.313) | (0.342) |
| Order | No | No | Yes |
| Socio-Demographics | No | Yes | Yes |
| Trust in MoH | No | No | Yes |
| Social Media | No | No | Yes |
| Alternative Lifestyle | No | No | Yes |
| Pseudo $R^2$ | 0.004 | 0.070 | 0.145 |
| Observations | 1562 | 1562 | 1562 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B21:** Vaccination by Average Returns in TG (Player B): MoH Classification (Full Sample) - Multi-nomial Logit

| | Vaccination Category (MoH) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| 1 (Indeterminate) | | | |
| Avg. Fraction Returned | -1.407*** | -1.389*** | -0.904* |
| | (0.430) | (0.427) | (0.468) |
| 2 (Vaxxer) | | | |
| Avg. Fraction Returned | -1.404*** | -1.366*** | -0.808* |
| | (0.359) | (0.373) | (0.430) |
| Order | No | No | Yes |
| Socio-Demographics | No | Yes | Yes |
| Trust in MoH | No | No | Yes |
| Social Media | No | No | Yes |
| Alternative Lifestyle | No | No | Yes |
| Pseudo $R^2$ | 0.006 | 0.071 | 0.145 |
| Observations | 1562 | 1562 | 1562 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B22:** Original and adjusted p-values of vaxxer variable in main regressions

| Dep. Var. | p-values | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|
| DG | Original | $< 0.001$ | $< 0.001$ | 0.005 | 0.01 |
| | Adjusted | 0.002 | 0.004 | 0.01 | 0.014 |
| TG (A) | Original | $< 0.001$ | $< 0.001$ | 0.003 | 0.005 |
| | Adjusted | 0.002 | 0.004 | 0.01 | 0.014 |
| TG (B) | Original | $< 0.001$ | $< 0.001$ | $< 0.001$ | 0.001 |
| | Adjusted | 0.002 | 0.004 | 0.003 | 0.005 |

Notes: The table reports the original and adjusted $p$-values of the variable "vaxxer" for each of our measures and for all six specifications that appear in Tables 4, 5, and 6. The $p$-values of the original model in this table are obtained from a regression model with non-robust standard errors. In the main text, we run the regressions and determine the significance levels using robust standard errors.

**Table B23:** Original and adjusted p-values of pro-sociality measures in main regressions of the pre-registration analysis plan

| Indep. Var. | p-values | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|
| DG | Original | 0.002 | 0.004 | 0.023 | 0.363 |
| | Adjusted | 0.004 | 0.007 | 0.026 | 0.38 |
| TG (A) | Original | 0.003 | 0.003 | 0.046 | 0.331 |
| | Adjusted | 0.005 | 0.006 | 0.056 | 0.339 |
| TG (B) | Original | $< 0.001$ | $< 0.001$ | 0.001 | 0.036 |
| | Adjusted | 0.001 | 0.001 | 0.002 | 0.044 |

Notes: The table reports the original and adjusted $p$-values of the independent pro-sociality measures in the specifications reported in Tables B10, B11, and B12. The dependent variable is the number of vaccinations (with 3 and 4 vaccinations classified as 3). The $p$-values of the original model in this table are obtained from a regression model with non-robust standard errors. In the main text, we run the regressions and determine the significance levels using robust standard errors.

## B.4 Additional Tables

**Table B24:** Giving in DG by Vaccination Status

| | Transfer Index | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Partially Vaccinated | -0.017 | -0.023 | -0.029 | -0.029 |
| | (0.026) | (0.026) | (0.027) | (0.027) |
| Not Vaccinated | 0.072*** | 0.068*** | 0.056** | 0.058** |
| | (0.023) | (0.023) | (0.025) | (0.027) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.014 | 0.016 | 0.027 | 0.027 |
| Observations | 900 | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B25:** Transfer in TG (Player A) by Vaccination Status

| | Transfer Index | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Partially Vaccinated | -0.064** | -0.065** | -0.076*** | -0.076*** |
| | (0.025) | (0.026) | (0.026) | (0.026) |
| Not Vaccinated | 0.073*** | 0.072*** | 0.051* | 0.053* |
| | (0.024) | (0.025) | (0.026) | (0.029) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.023 | 0.023 | 0.046 | 0.046 |
| Observations | 900 | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B26:** Average Returns in TG (Player B) by Vaccination Status

| | Transfer Index | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Partially Vaccinated | -0.012 | -0.013 | -0.012 | -0.012 |
| | (0.020) | (0.021) | (0.021) | (0.021) |
| Not Vaccinated | 0.064*** | 0.063*** | 0.065*** | 0.062*** |
| | (0.018) | (0.019) | (0.020) | (0.022) |
| Order | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes |
| Demographics | No | No | Yes | Yes |
| Trust Moh | No | No | No | Yes |
| $R^2$ | 0.020 | 0.020 | 0.023 | 0.023 |
| Observations | 900 | 900 | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

**Table B27:** Vaccination by Demographic Characteristics - Logit Regression

| | Vaccinated (Yes=1/No=0) |
|---|---|
| age | 0.04*** |
| | (0.01) |
| Female | -0.32* |
| | (0.18) |
| High Education | 0.18 |
| | (0.19) |
| High Income | 1.01*** |
| | (0.24) |
| Minority | -0.89*** |
| | (0.32) |
| Religiously Orthodox | -0.82*** |
| | (0.26) |
| Right Wing | -0.46** |
| | (0.19) |
| Pseudo $R^2$ | 0.14 |
| Observations | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

# C Willingness to Stand Up for One's Beliefs

In this section we describe our elicitation of a proxy of individuals' convictions. We leapfrogged on another project in which we approached the same participant pool who completed both questionnaires described in Section 3. We asked participants to rate the

**Table C1:** Transfers and Convictions-Proxy Index

| | Transfer Index | |
|---|---|---|
| | (1) | (2) |
| Convictions-Proxy Index | 0.017* | 0.025*** |
| | (0.009) | (0.009) |
| Socio-Demographics | No | Yes |
| Adjusted-$R^2$ | 0.003 | 0.024 |
| Observations | 726 | 726 |

Notes: $*p < 0.1, **p < 0.05, ***p < 0.01$.
Standard errors in parenthesis.

extent to which they agree with the following statements (on a scale of 1-5):[41]

- I am willing to fight for my beliefs even if it entails large personal costs.
- I invest time and/or money in promoting ideological issues (e.g. social, environmental, or political issues) that are important to me (e.g. join protests, attend group meetings, donate to NGOs/parties, actively volunteer in different activities that promote these issues, try to convince other people to take my side, promote my opinion on social networks).

Both questions are non-incentivized and they attempt to elicit different perspectives of individuals' willingness to stand up for their beliefs, i.e., their convictions. The first question is more direct, yet abstract in its nature, while the second describes more concrete behaviors that a person may undertake to advance their personal beliefs. In what follows we use each of these proxies separately as well as a *convictions-proxy index*, which is the average of the answers to both questions.

Our suggested convictions-based mechanism is based on two premises. The first is that convictions are correlated with high transfers in our experimental games. As stated in our pre-registration to the other project mentioned above, we test this link by looking at the correlations between individuals' transfers and these proxies. Tables C1, C2, and C3 report the results of the regressions in which the transfer index (which we constructed and used in Subsection 4.4) is the dependent variable. The independent variables are the convictions-proxy index, the extent of agreement with the first statement ("fight for beliefs"), and the extent of agreement with the second question ("ideologically active"), respectively. In all tables, both specifications control for the order of the questions, while the second column also includes socio-demographic controls. In line with our suggested mechanism, we find that the correlations between our transfer index and these proxies are positive.

[41]The separate project, the questions reported in this section of the appendix and the questions regarding trust in institutions reported in the next section were pre-registered on the OSF website. Identifying number https://doi.org/10.17605/OSF.IO/WS6UA.

**Table C2:** Transfers and Fighting for Beliefs

| | Transfer Index | |
|---|---|---|
| | (1) | (2) |
| Fight for Beliefs | 0.011 | 0.016* |
| | (0.008) | (0.008) |
| Socio-Demographics | No | Yes |
| Adjusted-$R^2$ | 0.000 | 0.019 |
| Observations | 726 | 726 |

Notes: $*p < 0.1, **p < 0.05, ***p < 0.01$.
Standard errors in parenthesis.

**Table C3:** Transfers and Ideological Activism

| | Transfer Index | |
|---|---|---|
| | (1) | (2) |
| Ideo Active | 0.012* | 0.017** |
| | (0.007) | (0.007) |
| Socio-Demographics | No | Yes |
| Adjusted-$R^2$ | 0.002 | 0.023 |
| Observations | 726 | 726 |

Notes: $*p < 0.1, **p < 0.05, ***p < 0.01$.
Standard errors in parenthesis.

Moving on to the second premise, we examine whether a quadratic relationship shows up between these proxies of convictions and the number of vaccinations. Table C4 reports the results of three regressions using this quadratic specification, one for each proxy of convictions. The first column uses the answers to the first question as the dependent variable, the second column uses the answers to the second question, and the third column uses the index that combines both questions. As can be seen in the table, we find some support for a quadratic relationship between the proxy for convictions and the number of vaccinations, especially when the first question is tested, either in isolation (column 1) or as part of the convictions-proxy index (column 3).

We acknowledge that our proxy of convictions suffers from some drawbacks. Most notably, it is non-incentivized, while convictions, by their very nature, express the willingness to engage in action when real stakes (and sometimes very high stakes) are involved. Another drawback is that we elicited these proxies during a period of political and civil unrest in which many people in Israel took to the streets to protest following the judicial reform set forth by the newly elected government. These events may have had an influence on the answer to these questions. Moreover, given the political nature of this civil unrest and the relationship between vaccinations and political orientation (see Table 2), the proximity to these events may have systematically biased our elicitation of proxies of convictions. Notwithstanding these drawbacks, we view the findings concerning these proxies as offering some validation for the convictions-based mechanism outlined in the main text.[42]

**Table C4:** Convictions-Proxy and Number of Vaccinations

| | Convictions-Proxy | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| # Vaccinations | -0.160 | -0.069 | -0.114 |
| | (0.107) | (0.089) | (0.082) |
| (# Vaccinations)$^2$ | 0.061** | 0.026 | 0.043** |
| | (0.027) | (0.022) | (0.021) |
| $R^2$ | 0.014 | 0.004 | 0.012 |
| Observations | 726 | 726 | 726 |

Notes: $*p < 0.1, **p < 0.05, ***p < 0.01$. Standard errors in parenthesis. Columns (1), (2), and (3) specify the dependent variable as the answers to the first question, second question, and the convictions-proxy index, respectively.

# D Alternative Mechanisms

Our leading explanation to the truncated U-shape of pro-sociality measures as a function of vaccination status is that the strength of convictions is a latent variable that affects both transfers in our experimental games and the tendency to vaccinate against Covid-19. While there may be other latent variables influencing these two observed behaviors, many of the potential candidates have been controlled for in our analysis and therefore cannot fully account for the results (see Section D.1 below). This section is dedicated to presenting the main alternative mechanisms and discuss the extent to which they are able to explain our results. None of these mechanisms can fully explain the patterns described in the body of the paper, which led us to present the conviction-based mechanism as the main candidate explanation.

## D.1 Mechanisms Tested Thus Far

### D.1.1 Religion

Religious people are, on average, more pro-social. This was shown both by comparing individuals with varied levels of religiosity (e.g., Everett et al., 2016 show it for Christians,

[42] In line with the pre-registration to the other project, we also ran the main regressions (Tables 4, 5, and 6) that appeared in the main text while including the convictions-proxy index as a control. The coefficient of the main variable of interest (vaccination status), as well as its significance levels remain qualitatively similar to those in the original regressions while the coefficient of the convictions-proxy index is positive and mostly significant (these regressions are available upon request). This means that while our proxy appears to correlate with transfers in our games, it does not seem to fully capture the channel of convictions, possibly due to its non-incentivized nature and the political contamination mentioned above.

Umer, 2020 for Muslims and Sosis and Ruffle, 2004 for Jews), and by priming religion before letting participants play the DG and similar games (e.g., Shariff and Norenzayan, 2007 and Ahmed and Salas, 2011). The reasons behind this relationship have been analyzed both in the social sciences (see e.g. Norenzayan and Shariff, 2008) and in the humanities (Xygalatas and Martin, 2016), and will not be reiterated here.

For our purposes, it's important to note that if indeed religiosity is positively correlated with prosociality, then it potentially could explain the negative correlation between transfers and vaccination. This could be the case if more religious individuals are less inclined to take the vaccine (because they rely less on science to guide their choices in life). However, while our data does show that being religiously orthodox is negatively correlated with taking the vaccine (see Table 2), this channel does not explain our results: The negative correlation between transfers and vaccination remains strong and statistically significant even after controlling for the level of religiosity (see column (3) in Tables 4-6, where religiosity is included as one of the various socio-demographic controls). Furthermore, it is not clear how the religiosity mechanism could account for the non-monotonic pattern we report.

#### D.1.2 Political Ideology and State Intervention

This potential mechanism operates as follows: People with a right-wing political orientation, prioritize maintaining their individual freedoms and are more opposed to various types of state interventions (Libertarianism).[43] Hence, they are more likely to object to state-mandated vaccination, in line with recent findings (Siegrist and Bearth, 2021; Wollebæk et al., 2022; Peng, 2022). At the same time, they hold more individualistic views and support the idea that a person should take care (only) of oneself, which might make them less inclined to be generous in the experimental tasks. This could have potentially explained a positive correlation between transfers and the tendency to get vaccinated. However, even though participants with a right-wing political orientation do seem to vaccinate less (see Table 2), there is a (weak) positive correlation between holding these political views and our transfer index ($\rho = 0.0704,\ p = 0.0513$). Accordingly, we find that non-vaccinated individuals in our sample transfer on average more, not less, than vaccinated individuals, suggesting that this mechanism cannot explain our findings.

### D.2 Mechanisms Tested in This Appendix

#### D.2.1 Social Media

Social media was a major platform through which anti-vaccine groups spread misinformation, conspiracies and other arguments against the vaccine (Puri et al., 2020). It has been documented that the spread of such content was associated with greater vaccine hesitancy (see for example Wilson and Wiysonge, 2020). At the same time, social media, by its

[43] Cappelen et al. (2024) highlight this tendency in the context of inequality and redistribution.

very nature, may be positively associated with being a social type of person and hence, potentially, having stronger pro-social attitudes. Note that this explanation has the potential to explain the differences in transfers between vaxxers and non-vaxxers, as reported in Tables 4-6, but cannot shed light on the truncated U-shape pattern of transfers as a function of vaccination status.

To test whether social-media usage explains the higher transfers of non-vaxxers compared to vaxxers, we utilize participants' responses from the second questionnaire, where they rated their social-media usage on a 5-point Likert scale. This questionnaire was completed after the experimental games. In line with the previous findings in the literature, the correlation between social-media involvement and the number of vaccinations is negative and significant ($\rho = -0.09,\ p = 0.016$). However, the second part of this suggested mechanism does not hold as there is no correlation between social-media involvement and the transfer index defined in Section 4.4 ($\rho = 0.0015,\ p = 0.963$).

#### D.2.2 Alternative Lifestyle

Following the experimental games in the second questionnaire, participants were asked a few questions that were meant to capture what we call "alternative lifestyle" variables. These include their perceived level of own spirituality, their use of conventional medicine and of alternative medicine (all reported on a 1-5 scale), and whether they are vegan/vegetarian. These questions were included in order to test (and potentially rule out) a mechanism that operates as follows: People with an "alternative lifestyle" are less likely to get vaccinated. At the same time, one might expect them to be more pro-social and more trusting than others. If this is true, then this could explain why non-vaxxers transfer, on average, more than vaxxers in our experimental games. As with social media discussed above, this explanation has the potential to shed light on the binary comparison between vaxxers and non-vaxxers but not on the more general non-monotonic pattern described in the text.

Indeed, Table D1 shows that the tendency to use alternative medicine has a negative impact on vaccination, and the opposite is true for the use of conventional medicine. Self-perceived spirituality is predictive of a lower tendency to vaccinate and so is being vegetarian or vegan (although the coefficient of the latter is not statistically significant). Thus far, these results are in line with the suggested mechanism. To explore this mechanism further, we construct an alternative-lifestyle index calculated as a weighted average of responses to the four questions we define as alternative-lifestyle variables (with conventional medicine usage contributing negatively to the index, i.e., higher use implies a lower index score). The correlation between this alternative-lifestyle index and the transfer index from Section 4.4 is positive and significant ($\rho = 0.143,\ p < 0.001$), suggesting this mechanism may indeed explain part of the negative correlation observed in Tables 4-6. We therefore turn next to investigate whether this mechanism substantially reduces the explanatory power of the vaccination variable in Tables 4-6. If it does, this would suggest that alternative-lifestyle factors are important omitted variables that may be driving the correlation between vaccination status and the transfers in our experimental games.

Table D2 presents this test. In the first four columns we regress the transfer index defined in Section 4.4 while gradually adding controls as in Tables 4-6, while in the fifth column we add the four alternative-lifestyle variables as explanatory variables. This column shows that the alternative-lifestyle variables indeed take away some explanatory power from the binary vaccination classification. Specifically, roughly one fourth of the effect size of the binary vaccination variable is "explained away" by alternative-lifestyle variables. However, the coefficient of the binary vaccination variable remains substantial in magnitude and significant. Therefore, the alternative-lifestyle mechanism cannot be the primary explanation for the observed gap in transfers between vaxxers and non-vaxxers.

**Table D1:** Vaccination by Alternative-Lifestyle Variables

| | Vaccinated (Yes=1/No=0) | |
|---|---|---|
| | (1) | (2) |
| Veg | -0.04 | -0.04 |
| | (0.04) | (0.04) |
| Spiritual | -0.07*** | -0.04*** |
| | (0.01) | (0.01) |
| Alternative Med | -0.04*** | -0.06*** |
| | (0.01) | (0.01) |
| Conventional Med | 0.10*** | 0.09*** |
| | (0.01) | (0.01) |
| Socio-Demographics | No | Yes |
| Adjusted-$R^2$ | 0.17 | 0.27 |
| Observations | 900 | 900 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

### D.2.3 Trust in Institutions

In this subsection we explore whether the level of trust in institutions can account for our findings, particularly those concerning the behavior of player A in the Trust Game.[44] The potential mechanism at play is the following: Individuals with low trust in institutions are less likely to vaccinate since the vaccine is offered by the country's institutions (Musa et al., 2022; Fobiwe et al., 2022). At the same time, they may have a relatively high level of trust in others, if their lack of trust in institutions is compensated for by higher trust in

[44]The mechanism suggested in this subsection deals specifically with the behavior of player A in the TG rather than with our three different measures as a whole. Nonetheless, given the high correlations across measures, it has the potential to shed light on the patterns of our transfer index in general. However, it may only be able to explain the difference in transfers between vaxxers and non-vaxxers rather than the non-monotonic pattern found in the data.

**Table D2:** Transfer Index by Vaccination and Alt Lifestyle

| | Transfer Index | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Vaxxer | -0.075*** | -0.074*** | -0.067*** | -0.068*** | -0.047** |
| | (0.017) | (0.017) | (0.018) | (0.020) | (0.020) |
| Order | Yes | Yes | Yes | Yes | Yes |
| # of Infections | No | Yes | Yes | Yes | Yes |
| Socio-Demographics | No | No | Yes | Yes | Yes |
| Trust Moh | No | No | No | Yes | Yes |
| Alternative Lifestyle | No | No | No | No | Yes |
| $R^2$ | 0.024 | 0.024 | 0.033 | 0.033 | 0.056 |
| Observations | 900 | 900 | 900 | 900 | 900 |

Notes: $^*p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$.
Standard errors in parenthesis.

other individuals.[45]

As a first glimpse into this mechanism, we follow our pre-registration and test the correlation between our measure of trust in-others as player A in the TG and the level of trust in the MoH (the more general measure of trust in institutions was only elicited in a follow-up study). We ran two specifications (no controls and a full set of controls) of a regression in which the fraction transferred as player A in the TG is the dependent variable and the level of trust in the MoH is the independent variable. The correlations are indeed negative, albeit quite weak and not significant with the full set of controls, as can be seen in Table D3.[46]

To further investigate this channel, we utilized a follow-up questionnaire that was distributed to the same pool of participants as part of a separate research project about five months later. In this follow-up questionnaire, we inquired about participants' level of trust (1-5) in nine institutions that were unrelated to healthcare and not too involved with the political reform advocated by the government when the survey was circulated (the full list appears in the third questionnaire in Appendix E). We created a trust-in-institutions index by averaging these ratings and used it to examine whether the level of trust in institutions may explain our findings.

As expected, Table D4 demonstrates a positive and significant coefficient of the trust-in-institutions variable when predicting vaccination.[47] However, as shown in Table D5, there is no correlation between trust in others and trust in institutions. The table reports

[45] Previous findings demonstrated a negative relationship between trust in others and some proxies of trust in institutions, such as the level of law enforcement (Wintrobe et al., 1995) and the amount of regulation (Aghion et al., 2010; Carlin et al., 2009), though there are other indications that the two types of trust are in fact complements (see e.g. Tabellini, 2008a,b, 2010).

[46] Relatedly, Naef and Schupp (2009) report weak correlations between trust as player A in the TG and trust in different institutions (not including the Ministry of Health).

[47] In these specifications we do not include the variable for trust in the MoH.

**Table D3:** Trust in TG (player A) and Trust in MoH

| | Frac. Transferred (Player A in TG) | |
|---|---|---|
| | (1) | (2) |
| Trust in MoH | -0.013** | -0.009 |
| | (0.006) | (0.007) |
| Order | No | Yes |
| # of Infections | No | Yes |
| Socio-Demographics | No | Yes |
| Alternative Lifestyle | No | Yes |
| $R^2$ | 0.003 | 0.027 |
| Observations | 1562 | 1562 |

Notes: **p* <0.1, ***p* <0.05, ****p* <0.01.
Standard errors in parenthesis.

the results of a regression in which the dependent variable is the fraction transferred by player A, and the index of trust in institutions is the main explanatory variable. The coefficient on the trust-in-institutions index is not statistically significantly different from zero (if anything, the sign of the coefficient is positive). Thus, we can reject the conjecture that this mechanism might explain our findings regarding player A's behavior in the TG.

**Table D4:** Vaccination by Trust in Institutions

| | Vaccination Status (1=Yes, 0=No) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Trust in Institutions | 0.144*** | 0.141*** | 0.097*** |
| | (0.022) | (0.021) | (0.022) |
| # of Infections | No | Yes | Yes |
| Socio-Demographics | No | No | Yes |
| $R^2$ | 0.065 | 0.073 | 0.169 |
| Observations | 726 | 726 | 726 |

Notes: *$p$ <0.1, **$p$ <0.05, ***$p$ <0.01.
Standard errors in parenthesis.

## D.3 Other Potential Mechanisms

### D.3.1 Cognitive Ability and Selfishness

Another potential explanation to the negative correlation between the observed transfers and the tendency to get vaccinated involves the latent variable of intelligence (or, more generally, cognitive ability). The suggested mechanism operates as follows: People who are more intelligent are both more inclined to get vaccinated and more inclined to act selfishly in our experimental games.

**Table D5:** Trust in Others and Trust in Institutions

| | Frac. Transferred (Player A in TG) | |
|---|---|---|
| | (1) | (2) |
| Trust in Institutions | 0.006 | 0.016 |
| | (0.013) | (0.013) |
| Order | Yes | Yes |
| Socio-Demographics | No | Yes |
| $R^2$ | 0.000 | 0.034 |
| Observations | 726 | 726 |

Notes: $*p < 0.1, **p < 0.05, ***p < 0.01$.
Standard errors in parenthesis.

The first part of this mechanism is established in Elinder et al. (2023). However, as a whole, this mechanism, as those that appeared earlier, is insufficient to explain our findings. While one might argue that calculating the equilibrium-behavior as the first mover in the TG requires cognitive ability, it is much harder to make that claim when it comes to the second mover in the game, and even more so for the DG (which, despite its name, is not even a game but a non-interactive decision problem). In fact, Chen et al. (2013) show that measures of cognitive ability that are less sensitive to the intrinsic motivation of the participant (such as Math SAT scores) are positively related to generosity (including giving in the DG),[48] and Achtziger et al. (2015) find that cognitive resources are positively correlated with non-selfish behavior in the DG.

Nonetheless, to further explore the possibility that cognitive ability is behind the gap in behavior in our experimental games, we conduct a simple test using our data. It is anticipated that individuals with higher cognitive abilities will perform better in these games, particularly in the role of player $A$ in the TG (which is the only task that requires strategic thinking). Consequently, if non-vaccinated individuals indeed possess the lowest cognitive abilities, we would expect them to underperform with respect to the other groups.

To check this prediction, we computed the average return by player $B$ in the TG in our sample for every possible amount transferred by player $A$. This was subsequently used for calculating the expected earnings for every amount transferred by player $A$. Using the distribution of transferred amounts of player $A$ for each vaccination status, we then estimated the expected earnings for each group. The results indicate that non-vaccinated individuals earn an average of 43.36 ILS, partially vaccinated individuals earn 42.72 ILS, and vaccinated individuals earn 42.95 ILS. Thus, contrary to the cognitive ability hypothesis, non-vaccinated individuals actually perform slightly better than the other groups.

Hence, we do not find the link between intelligence and transfers in our games to

[48] As Chen et al. (2013) explain in their paper, the evidence in the literature is mixed when it comes to measures of cognitive ability that are sensitive to intrinsic motivation. See e.g. Ben-Ner et al. (2004), Han et al. (2012) and the literature cited there.

be a convincing explanation for our results. Furthermore, even if we ignore the above difficulties with this suggested mechanism and the straightforward exercise conducted using our data, and accept the underlying channel of intelligence, it is not able to account for the non-monotonic pattern in our data. In particular, given the relatively low earnings of the partially vaccinated in the role of player A in the TG, it seems unlikely that their partial vaccination status was driven by overly sophisticated behavior.

#### D.3.2 Social Norms

Both prosociality and vaccination may be subject to social norms. In the domain of prosocial behavior, the prevailing social norm is to act generously and fairly. As for vaccination most people faced social pressure to get vaccinated. Thus, if social norms were the main driver of behavior, we would expect a positive correlation between transfers in our games and vaccination, in stark contrast to the observed pattern in our data.

However, social pressures might differ across groups. For example, a large share of the non-vaxxers may belong to social circles where the norm is *not to* get vaccinated. This might suggest that both non-vaccinated and fully vaccinated individuals are conformist (each adhering to their own norm), while partially vaccinated are less conformist, as they do not fully align with any of the prevailing norms. Since conformism should be positively correlated with generosity, the low level of transfers observed among the partially vaccinated is consistent with this explanation.

Nevertheless, we think this explanation is not very convincing. First, the binary pattern according to which the non-vaccinated are much more generous on average is the strongest pattern we document, and, as explained earlier, it goes completely against the main trend predicted by conformity to social norms.[49] Second, as opposed to giving in the DG or transferring money back to the sender as player B in the TG, the behavior of player A in this game is widely considered to be unaffected by social norms.[50] However, Figure 3 shows that the U-shape is very pronounced for player A's behavior. Third, as explained in Section 7.1, we can isolate a subgroup of "admittedly anti-vaccine" individuals. A social-norms based explanation predicts that, among this group, more vaccinations is indicative of more conformism (acting in contrast to one's preferences), hence should be positively correlated with higher transfers in the experimental games. This is the exact opposite of the pattern documented in Figure 4. Finally, our experiment was conducted online, with participants making decisions in isolation. This setup naturally limited the influence of social norms.

We therefore feel that despite its general appeal, the social-norms based explanation fails to account for the observed patterns.

[49] Even if we compare only the end groups (non-vaxxers and fully vaccinated individuals), and assume that in both groups the prevailing norm corresponds to actual behavior, transfers should be roughly the same across groups, contrary to the stark difference between these two groups.

[50] Consider the title of Bicchieri et al. (2011)'s paper: "Trustworthiness is a social norm, but trusting is not". Also Dunning et al. (2014) write that their "data suggest that the norm involved in trust decisions is more moral and personal in nature than social".

#### D.3.3 Self signaling

If not vaccinating against Covid-19 bears a cost for one's reputation, one might be more inclined to signal—either to others or to oneself—that they are in fact pro-social. This could, in principle, explain the binary pattern, where non vaxxers transfer more, on average, than the vaxxers (and, given the anonymity of the setup, such signaling most likely takes the form of self signaling). However, this explanation falls short of being able to explain the full, non-monotonic, pattern of transfers. In particular, it fails to explain why the partially vaccinated would be less in need to signal prosociality compared to the fully vaccinated. This fact, together with the separation we maintained between questionnaire 1, which was about Covid-19 vaccination, and questionnaire 2, which included the experimental tasks (see more details in Section 3), suggests that signaling, even if it is only self-signing, is not a convincing explanation for the patterns we observe in the data.

#### D.3.4 Vaccine Shortage

Many countries around the world experienced vaccine shortages during the Covid-19 pandemic. When a shortage exists or is anticipated, individuals may choose to vaccinate out of concern for vaccine availability. Specifically, altruistic individuals might delay their vaccination to prioritize others, whereas selfish individuals may get vaccinated promptly to avoid potential stock depletion. This behavior may be reflected in the higher transfers of non-vaccinated individuals in our experimental games.

However, this channel is unlikely to play a role in our study, as Israel was one of the first countries to receive both the Pfizer and Moderna vaccines and consistently maintained an ample supply. This ensured availability for anyone wishing to vaccinate throughout the pandemic. Furthermore, non vaxxers in our study had ample time to get vaccinated. Thus, even if, theoretically, they initially refrained from doing so out of concern for others' welfare, they could have easily vaccinated later on.

# E Instructions

## First Questionnaire

General Instructions

Hello and thank you for your participation in a short questionnaire regarding Covid-19. Before we begin, let us state a few general comments.

1. The questionnaire is formulated in masculine form but refers to women and men alike.

2. The questionnaire is expected to take a few minutes to complete.

3. The questionnaire is anonymous; you are not required to provide any identifying information.

Informed Consent

You do not have to participate in the questionnaire and non-participation will not affect you in any way. If you would like to, you can stop the completion of the questionnaire and you will not be affected by it in any way. The questionnaire is completely anonymous. Thank you in advance for your cooperation. In order to continue to the questionnaire please mark the box below:

- I certify that I have read the consent form. I agree to complete this questionnaire and that my answers will be used for research purposes only.

Questions

1. Have you ever been infected with Covid-19 (i.e., tested positive to a Covid-19 PCR/antigen test)? (yes/no)
    - (If the answer to question 1 is yes): How many times were you infected with Covid-19?
        - 1
        - 2
        - 3+
2. Did you receive the vaccine against Covid-19 (at least once)? (yes/no)
    - (If the answer to question 2 is yes): How many vaccine doses did you receive?
        - 1
        - 2
        - 3
        - 4
    - (If the answer to question 2 is yes):
        - Did you make the decision to receive one of the first two doses of the vaccine due to pressure from your employer?
        - Did you make the decision to receive one of the first two doses of the vaccine due to pressure that followed from the restrictions on those who were not eligible to receive a green pass (for example inability to go out or to go on vacation)?
    - (If the answer to question 2 is no): Why didn't you receive the vaccine? (you can mark more than one answer)

- I was not convinced of the vaccine's effectiveness
- I was concerned about side effects
- I was not bothered by the risk to contract the virus
- Health reasons prevent me from taking the vaccine
- Other (please specify):

## Second Questionnaire

General Instructions

Greetings. Thank you for agreeing to participate in a short questionnaire in decision making. First, allow us to make a few general comments.

1. The questionnaire is formulated in masculine form but refers to women and men alike.
2. The questionnaire includes two parts. In Part A you will play two short "games" and in Part B you will be asked to answer a few short questions. The identity of players who play against you will not be disclosed and neither will your identity be disclosed to them. Matching participants for the purpose of playing the games is done anonymously by the computer.
3. The questionnaire is expected to take a few minutes to complete.
4. The questionnaire is anonymous; you are not required to provide any identifying information.
5. For completing this questionnaire, you may be able to earn significant amounts of money that will be paid in addition to the participation fee. As this study ends, in four days, 10% of those who finish the questionnaire will be randomly selected by the computer and they will earn money according to one of the two games played in Part A. There is a 50% chance that the payment will be determined by the first game and a 50% chance that it will be determined by the second game (the computer will randomly choose one of them). Keep in mind that this payment is in addition to the payment that you will receive for participation.

Informed Consent

You do not have to participate in the questionnaire and non-participation will not affect you in any way. If you would like to, you can stop the completion of the questionnaire and you will not be affected by it in any way. The questionnaire is completely anonymous. Thank you in advance for your cooperation. In order to continue to the questionnaire please mark the box below:

- I certify that I have read the consent form. I agree to complete this questionnaire and that my answers will be used for research purposes only.

Game 1 (Remember that if you will be randomly drawn to receive additional payment, there is a 50% chance that this game will determine your payoffs)

In this game there are two players: player A and player B. In the beginning of the game player A receives 40 NIS. This game consists of one stage only. Player A decides on the amount that he would like to transfer to player B out of the total amount of 40 NIS (he can transfer 0,10,20,30, or 40 NIS). Player B has no active role in this game. He simply receives the amount of money that was transferred to him.

Payoffs in Game 1

Player A will receive the amount that he kept for himself and player B will receive the amount that player A transferred over to him. You will play this game in both roles, once as player A and once as player B (in the role of player B you will not be asked to do anything). In each of the roles, a new participant will be randomly chosen to play against you.

If you will be randomly chosen to receive payment (with 10% chance) and this game will be chosen for payment (with 50% chance) then you will be paid according to one of the two roles in which you will play with an equal chance (according to a random draw made by the computer).

You are now playing in the role of player A.
What is the amount that you would like to transfer to player B out of the total amount of 40 NIS that you currently have?

- 0
- 10
- 20
- 30
- 40

You are now playing in the role of player B (against a different player randomly chosen by the computer)

As stated earlier, player A can transfer to you 0,10,20,30 or 40 NIS.
As player B you are not required to do anything.
Please press continue in order to continue to the next game.

Game 2 (Remember that if you will be randomly drawn to receive additional payment, there is a 50% chance that this game will determine your payoffs)

In this game there are two players: player A and player B. In the beginning of the game player A receives 40 NIS. This game consists of two stages.

- Stage 1: Player A decides on the amount that he would like to transfer to player B out of the total amount of 40 NIS (he can transfer 0,10,20,30, or 40 NIS). The amount transferred to player B will be multiplied by 3 so that player B will receive three times the amount transferred to him by player A.
- Stage 2: Player B decides on the amount that he would like to return to player A out of the total of the multiplied amount that he received.

Payoffs in Game 2

Player A will receive the amount that he kept for himself in Stage 1 in addition to the amount that player B will return to him in Stage 2. Player B will receive the amount that he kept for himself in Stage 2. For example, if you, as player A decided to transfer to player B an amount of X NIS out of the total amount of 40 NIS then after Stage 1 you will have 40-X NIS and player B will have 3X NIS. In Stage 2 player B will decide how much of the amount of 3X to return to you. The amount that he will transfer back to you will be added to the amount of 40-X that you already had and that will become your final payoff. Player B will receive 3X minus that amount that he will return to you.

You will play this game in both roles, once as player A and once as player B. In each of the roles, a new participant will be randomly chosen to play against you.

If you will be randomly chosen to receive payment (with 10% chance) and this game will be chosen for payment (with 50% chance) then you will be paid according to one of the two roles in which you will play with an equal chance (according to a random draw made by the computer).

You are now playing in the role of player A. What is the amount that you would like to transfer to player B out of the total amount of 40 NIS that you currently have?

- 0
- 10
- 20
- 30
- 40

You are now playing in the role of player B (against a different player randomly chosen by the computer)

As stated earlier, player A can transfer to you 0,10,20,30 or 40 NIS. At this stage we do not know what will be the amount that he will transfer over to you. Therefore, we ask you to state how much you would return for any possible scenario. What is the amount that you would like to return to Player A if he transferred 10 NIS to you (that is, if you will have 30 NIS after Stage 1):

- 0
- 10
- 20
- 30

What is the amount that you would like to return to Player A if he transferred 20 NIS to you (that is, if you will have 60 NIS after Stage 1):

- 0
- 10
- 20
- 30
- 40
- 50
- 60

What is the amount that you would like to return to Player A if he transferred 30 NIS to you (that is, if you will have 90 NIS after Stage 1):

- 0
- 10
- 20
- 30
- 40
- 50
- 60
- 70

- 80
- 90

What is the amount that you would like to return to Player A if he transferred 40 NIS to you (that is, if you will have 120 NIS after Stage 1):

- 0
- 10
- 20
- 30
- 40
- 50
- 60
- 70
- 80
- 90
- 100
- 110
- 120

You will now be presented with a few short questions. Please answer sincerely, thank you.

1. To what extent are you involved in social media networks? WhatsApp isn't considered a social network for the purpose of this question (1=not involved at all, 5=very involved)?
2. Are you vegan or vegetarian? (yes/no)
3. To what extent do you perceive yourself as a spiritual person (1=not spiritual at all, 5=very spiritual)?
4. To what extent do you rely on alternative medicine (1=not at all, 5=strongly trust)?
5. To what extent is the following sentence true for you: "when I am sick, I tend to take (conventional) medication" (1=not at all, 5=very much)
6. To what extent do you trust the Ministry of Health (1=complete distrust to 5= very strong trust)?

### Third Questionnaire

This questionnaire had a first part that was conducted as part of a different study. Below we report part B of the questionnaire. Some questions in this part were also not relevant for this study but we report them here for the sake of completeness (they appear in italics).

Part B
We will now ask you to answer a few short questions. Please answer sincerely, thank you.

Question 1: Here is a list of ten public institutions.[51] Please mark your level of trust in each of them: 1=very low trust, 2=low trust, 3=medium trust, 4=high trust, 5=very high trust

- Israel Police
- Israel Defense Forces
- Your local municipality
- The education system
- Lower level courts ("Hashalom" courts) - civilian and criminal disputes of lower order
- Medium level courts ("Mehozi" courts) – civilian and criminal disputes of higher order
- *The Supreme Court*
- The tax authority
- The ministry of environmental protection
- Bank of Israel

Question 2. Please mark your level of agreement with the following statement:

- I am willing to fight for my beliefs even if it entails large personal costs (1=agree to a very small extent, 2=agree to a small extent, 3=agree to a medium extent, 4=agree to a large extent, 5=agree to a very large extent).

Question 3. Please mark your level of agreement with the following statement:

- I invest time and/or money in promoting ideological issues (e.g. social, environmental, or political issues) that are important to me (e.g. join protests, attend group meetings, donate to NGOs/parties, actively volunteer in different activities that promote these issues, try to convince other people to take my side, promote my opinion on social networks). (1=agree to a very small extent, 2=agree to a small extent, 3=agree to a medium extent, 4=agree to a large extent, 5=agree to a very large extent).

[51] In this study, we were only interested in nine of these institutions. The supreme court which appears below in italics, was not relevant for this study.

*Question 4. Please rate your view regarding the judiciary reform put forward by the current government on a scale of 1=strongly oppose to 5=strongly support.*[52]

[52] Not relevant for this study.