The Fundamental Determinants of Protest Participation: Evidence from Hong Kong's Antiauthoritarian Movement

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Abstract

Which fundamental traits are associated with individuals' participation in antiauthoritarian protests? We conduct a series of surveys eliciting university students' participation in Hong Kong's antiauthoritarian movement, covering a period that included protests ranging from tens of thousands to over one million participants. We construct a comprehensive profile of fundamental economic preferences: risk and time preferences plausibly affecting an individual's costs of protest participation; social preferences affecting the benefits. We also elicit other fundamental traits: personality, cognitive abilities, and socioeconomic background. We document several facts about protest participants: (*i*) fundamental economic preferences, particularly risk tolerance and pro-social preferences, are the strongest predictors of protest participation; (*ii*) the strongest predictors are the same for modest and massive protests, with larger effects for massive protests; (*iii*) participation in massive protests is not driven by marginal types, but rather by inframarginal types; (*iv*) both the distribution of fundamental preferences and their relationship with protest participation are very similar between university students and the broader population; and, (*v*) willingness to respond honestly to sensitive survey questions is high and stable over the entire sample period. Our findings suggest that economic preferences be considered alongside class background and personality as deeply determined traits driving protest participation and can inform the development of dynamic models of protest movements.

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1 Introduction

For over two hundred years, people worldwide have taken to the streets and demanded democratic political change from authoritarian rulers. Such protest movements have been a critical driver of economic, social, and political change (e.g., Acemoglu and Robinson, 2012, 2019; Aidt and Franck, 2015). Yet, little is known about the traits of the individuals who participate in these movements: are protests attended by disruptive, anti-social individuals? Do massive protests attract participants with different traits — for example, opportunists who sense a change in the political environment? Answers to these questions can help us better understand both individual protest events as well as the evolution of movements demanding democratic political rights.

In this paper we document the characteristics of participants in antiauthoritarian protests in Hong Kong as its democratic movement evolved, covering a period with both modest and massive events. Hong Kong's fight for political rights against the ruling Chinese Communist Party (CCP) represented a unique opportunity to study the supporters of a high-stakes political movement. The protest movement aimed at attaining fundamental political and civil rights, and achieved some meaningful concessions from the CCP. We are able to conduct a series of surveys over several years, eliciting fundamental traits and protest participation. Importantly, this could be done without significant distortion from self-censorship as a result of Hong Kong's legal protection of the right to protest throughout our study period.[1]

We focus on protest participation among thousands of university students in Hong Kong — a group of individuals at the heart of its movement for democratic representation and self-determination. We link protest participation to a range of individual characteristics that are plausible deep drivers. We begin with fundamental economic preferences, increasingly seen as playing an important role in shaping political outcomes (Enke, 2020). These include time and risk preferences, which shape the costs of protest participation; and, because protest participation contributes to a political public good (Cantoni et al., 2019) and because protest participation is fundamentally a social activity, social preferences as well. We also elicit other fundamental traits: personalities (the

[1] As discussed below, we directly test for self-censorship, and find no evidence for it. The implementation on July 1, 2020, of a national security law passed in Beijing has fundamentally altered Hong Kong's political landscape, significantly restricting political behavior as well as academic research on such behavior.

"Big 5"); cognitive ability; and socioeconomic backgrounds, reflecting deep economic interests (i.e., "class"). This allows us to construct, to our knowledge, the most comprehensive mapping of fundamental individual characteristics ever collected on a group of potential political actors, especially on actors in an ongoing antiauthoritarian political movement.[2] We conduct surveys of university students over a period of time during which Hong Kong experienced protests ranging in size, with multiple protests attended by tens of thousands of participants in the years 2016–2018, and several attended by hundreds of thousands, up to a million individuals in 2019.[3] We complement these with a survey of protest participation and a subset of fundamental traits elicited from a representative sample of the Hong Kong population.

We document several facts about protest participants in Hong Kong: (*i*) fundamental economic preferences, particularly risk tolerance and pro-social preferences, are the strongest predictors of protest participation; (*ii*) the strongest predictors are the same for modest and massive protests, with their effects larger for massive protests; (*iii*) participation in massive protests is not driven by marginal types, but rather by inframarginal types; (*iv*) both the distribution of fundamental preferences and their relationship with protest participation are very similar between university students and the broader Hong Kong population; and, (*v*) willingness to respond honestly to sensitive survey questions is high and stable over the entire sample period.

These results suggest that in addition to class background (Marx, 1977; Acemoglu and Robinson, 2006) and personality, which social scientists have long seen as deep determinants of political behavior, economic preferences are another deeply determined trait playing a key role. Moreover, large protests (at least in Hong Kong) do not arise from convincing new types to participate, for example, due to a sudden change in perceptions about others, resulting from self-censorship (Kuran, 1997). Rather, large protests arise from the even greater participation of risk tolerant, prosocial types. Our work suggests that far from being anti-social, protest participants are among the most *pro*-social individuals in society. Far from being opportunists, participants in mass events

[2]The "fundamental" characteristics we consider are pre-determined and quite stable over time (see, for example, Meier and Sprenger, 2015, and Schildberg-Hörisch, 2018, on economic preferences, and Soldz and Vaillant, 1999, on personality traits). However, it is important to note that they may be correlated with other factors shaping protest participation, so caution is needed in interpreting the associations we observe as causal.

[3]See Cantoni et al. (2016), Cantoni et al. (2019), and Bursztyn et al. (2021) for additional discussion and documentation of our surveys of Hong Kong university students.

share fundamental traits with the vanguard leading smaller protests: willingness to take risk and pro-sociality, which unite them across different walks of life.

These findings contribute to a growing political economy literature studying protest participation. Much of this work has been theoretical (e.g., Chwe, 2000, Shadmehr and Bernhardt, 2011, Edmond, 2013, Barberà and Jackson, 2020, Shadmehr, 2021), while recent empirical work has examined the roles of beliefs, incentives, and social interactions in shaping protest participation (e.g., Acemoglu et al., 2018, Cantoni et al., 2019, Enikolopov et al., 2020, Manacorda and Tesei, 2020, González, 2020, Bursztyn et al., 2021). We are the first to study the association between protest participation and the range of fundamental traits examined here.

In so doing, we join a long line of scholars focusing on the role of deep individual characteristics in shaping political behavior. In the wake of World War II, social psychologists undertook the study of the "authoritarian personality," aiming to understand the appeal of Fascism (e.g., Adorno et al., 1950). More recently, scholars have intensively studied contemporary links between personality traits and political ideology and behavior (e.g., Block and Block, 2006; Carney et al., 2008; Mondak et al., 2010; Gerber et al., 2010, 2011, 2012; Ha et al., 2013; Schoen and Steinbrecher, 2013; Greene and Robertson, 2017; Truex, forthcoming). In addition to personality traits, scholars have examined associations between political ideology and risk preferences (Kam, 2012); sense of control (Littvay et al., 2011); altruism (Zettler and Hilbig, 2010); and overconfidence (Ortoleva and Snowberg, 2015).[4] In recent work, Falk et al. (2018) measure economic preferences around the world and link them to political outcomes. We elicit personality traits alongside economic preferences for the same individuals, allowing us to compare their contributions to protest participation.

Finally, we contribute to a growing empirical literature on protests in Greater China: Lorentzen (2013) highlights the central government's tolerance of certain types of protests; King et al. (2013) study information control policies that aim at suppressing collective actions; Campante et al. (2021) study the government's fiscal and personnel policy responses to protests. Recent work has also studied how technology can promote protests (Qin et al., 2020) or suppress them (Beraja et al., 2021). Our focus on Hong Kong citizens' demands for Western-style political rights is

[4]In related work, Bergolo et al. (2021) study the impact of honesty, selfishness, and social norms on another politically-relevant behavior: tax evasion. Social scientists have also studied individual traits predicting selection into public service (Dal Bó et al., 2013; Dal Bó et al., 2017; Ashraf et al., 2020).

particularly relevant today given the increasingly assertive and nationalistic policies undertaken by China in Hong Kong and elsewhere. Though currently repressed, antiathoritarian protests in Greater China may well reappear in the years ahead; understanding their drivers is thus of interest to both academics and policymakers (Tung and Kasuya, 2021).

2 Hong Kong's antiauthoritarian movement

In the July 1, 1997, "handover" to China, Hong Kong was transferred from its status as a British colony, with limited democratic political rights but strong protections of civil liberties and respect for the rule of law, to being a Special Administrative Region within the People's Republic of China. The political institutions of Hong Kong are defined by its quasi-constitution — the "Basic Law" — and follow a policy known as "one country, two systems."

The Basic Law left ambiguous several important dimensions that have been bargained over between the so-called "pan-democracy" and "pro-Beijing" camps since the handover. Prior to the introduction of National Security Legislation in 2020, the confrontation between Hong Kong citizens and the Chinese government generated protest marches held every year on the anniversary of the handover on July 1. Turnout varied significantly across years: in the years in which we conducted our surveys (between 2016 and 2019), the July 1 marches were attended by 110,000 people; 66,000 people; 50,000 people; and, 550,000 people, respectively.

Some of the July 1 marches achieved major policy changes; for example, the withdrawal of national security legislation that threatened civil-liberties (2003) and the withdrawal of a national (pro-CCP) curriculum (2012). In addition to the July 1 march, 2019 saw its largest protest on June 9, with over one million people attending, in reaction to a proposed extradition bill which would have given the Hong Kong government the right to transfer individuals to China. As a consequence of a series of large protests throughout 2019, the bill was eventually withdrawn. The repeated nature of the July 1 marches is a feature that the Hong Kong antiauthoritarian protests share with many other political movements.

3 Data

HKUST student surveys University communities have long represented a core concentration of participants in antiauthoritarian movements, making them a particularly informative population to study. Our analysis here is based on a series of surveys conducted between June 2016 and November 2019. To conduct each survey wave, a recruitment email was sent to the entire undergraduate population of the Hong Kong University of Science and Technology (HKUST). We generated response rates between 15 and 20 percent in each survey wave. We ran experiments with some survey respondents (Cantoni et al., 2019; Bursztyn et al., 2021), and we thus drop individuals in experimental treatment groups whose protest behavior may have been affected by treatment. This leaves us with a sample of 599 subjects in 2016; 692 subjects in 2017; 860 subjects in 2018; and 950 subjects in 2019.

Our primary outcome variable is students' self-reported protest participation — we consider the possibility of misreporting this potentially sensitive behavior further below and conclude that students very likely report truthfully. We specifically ask about protest participation in the July 1 march of the year of the survey in 2016–2018, and we ask about protest participation in the June 9 protest in the 2019 wave. This allows us to observe participation in four protest marches, three of which were of modest size (in the tens of thousands of attendees), and one of which was massive (over a million). The patterns of protest participation among the students in our sample correspond with the total protest attendance: participation in our sample ranged from 1.3%–4.8% in the modest protests of 2016–2018, and was 40.3% in the June 9, 2019 protest.

We consider several fundamental characteristics of (potential) protesters. First, we elicit a complete profile of students' economic preferences, covering five dimensions: *(i)* risk preferences; *(ii)* time preferences; *(iii)* altruism; *(iv)* reciprocity; and, *(v)* preferences for redistribution.[5] Next, we elicit individuals' "Big 5" personality traits following Howard et al. (1996). Our survey included 25 questions measuring *(i)* neuroticism; *(ii)* extraversion; *(iii)* openness; *(iv)* agreeableness; and, *(v)* conscientiousness.We measure cognitive ability using the Cognitive Reflection Test

[5]Elicitation of risk preferences, time preferences, altruism, and reciprocity is based on Falk et al. (2018). We add an incentivized component to their original risk preferences module.

(Frederick, 2005). Finally, we elicit students' demographic characteristics and socioeconomic backgrounds. We provide summary statistics and detailed information on the survey in the Online Appendix.

HKPSSD survey To broaden the scope of our research and compare the patterns of protest participation among university students to those in the general public, we partnered with the Hong Kong Panel of Social Study Dynamics (HKPSSD), which surveys a representative sample of the Hong Kong population.[6] In addition to the survey's collection of household-level and individual-level information, in the third HKPSSD survey wave (administered between July and November 2015), we added a short module on political behavior. Specifically, we asked whether subjects participated in an antiauthoritarian protest within the previous five years; 6.7% of the HKPSSD sample reported participating in some antiauthoritarian protest over this time frame.[7] We also included the elicitation of a subset of the fundamental preferences measured in the HKUST survey (not all preferences were elicited from all respondents due to time constraints). We are able to collect data on protest participation for 2,627 individuals. We provide summary statistics and detailed information on the survey in the Online Appendix.

4 Fundamental determinants of protest participation

Baseline analysis: evidence from the student survey In the first two columns of Figure 1, we present the distributions of fundamental economic preferences as well as the relationships between these preferences and protest participation, splitting our data between the 2016–2018 period (modest protests) and 2019 (massive protest). Note that all explanatory variables are constructed from several component survey questions, which are converted to standardized indices having mean zero and standard deviation of one in the respondents' population (following Anderson, 2008).[8]

[6]The HKPSSD is Hong Kong's benchmark survey of households, and follows closely the examples of the leading household panels in the world, such as the Panel Study of Income Dynamics (PSID) in the US. For more information on the HKPSSD, see Wu (2016).

[7]Protests included the Candlelight Vigil for the June 4 Massacre, July 1 marches, Anti-National Education protests, and the Occupy Central Movement.

[8]Only our measures of gender, birth year, and religiosity (religious/atheist) are not standardized.

The grey histograms in each graph show the distribution of the explanatory variable; there are no noticeable differences in the distribution of economic preferences among survey respondents between the waves in 2016–2018 and the 2019 wave.[9] The black regression line, and the corresponding confidence bands, represent the bivariate relationship between the corresponding trait and protest participation. One can see that fundamental economic preferences are often statistically significant predictors of protest participation. We report two regression coefficients: the first value corresponds to the bivariate relationship between the explanatory variable and political participation (as a binary variable). The second value corresponds to a regression in which the dependent variable has been standardized; this allows us to compare the relative magnitude of the effect, abstracting from the large level differences in political participation between the 2016–2018 events and the 2019 protest.

Overall, the *qualitative* relationships between fundamental preferences and protest turnout are very similar between small and large protests. Subjects with greater risk tolerance, who are more patient, and who are more pro-social (reciprocal and altruistic) turn out more for both small and large protests. The *quantitative* relationships are quite different, however: the effects of risk tolerance, patience, and pro-sociality are all several times larger in 2019, when the protest studied was massive. Importantly, this is not merely a level effect: after standardizing the dependent variable, to account for the substantially higher levels of turnout, effect sizes in 2019 remain 2–3 times larger than in prior years. An additional measure of pro-social preferences (preferences for redistribution) also strongly and significantly predicts turnout in the 2019 protest. These patterns suggest that larger protests do not draw in individuals with lower values of these characteristics (i.e., "marginal types"); rather, large protests draw more participation by similar types of individuals to those who were more likely to turn out to small protests (i.e., "inframarginal types").

In Figure 2, we present graphs analogous to those in Figure 1, but now considering the association between the Big 5 personality traits, as well as cognitive ability, and protest participation. The distributions of these fundamental factors look very similar across years, both for personality traits and cognitive ability. We find that personality traits and cognitive ability do not strongly

[9] Since the variable is standardized *across all years*, and not within each year, any shifts in the mean level of responses would also be evident from the comparison.

predict turnout at the smaller protests; only greater "openness" predicts higher turnout. In the large protest of 2019, lower openness actually predicts turnout, while greater conscientiousness now predicts turnout more strongly.

Finally, in Figure 3, we present analogous graphs showing the associations between subjects' backgrounds (e.g., socioeconomic status and demographics) and protest participation. The distributions of these variables are again very similar across survey years. We find that the effects of socioeconomic status and other dimensions of background are generally weak. The effects of demographic characteristics differ between the small and large protests; we find that men are significantly more likely to protest when protests are large, in 2019; and, younger students are more likely to protest when protests are small, in 2016–2018.

Comparison with the general public In the third columns of Figures 1 and 3, we show analogous patterns for the fundamental economic preferences and background characteristics available in the HKPSSD. One first sees that the distributions of fundamental factors in the representative sample of the Hong Kong population are broadly similar to those in the student sample. One also sees that the relationships between economic preferences and protest participation are qualitatively very similar to those in the student surveys. The magnitudes of estimated effects are also comparable to the ones found in the student sample in 2016–2018, both in absolute and in standardized terms. In particular, risk-tolerance, patience, and pro-social preferences are all positively associated with protest participation in the general public, just as they were for the student sample. Examining the associations between demographics and protest turnout, we see a higher turnout rate among men in the general public, just as we saw among students in 2019. Overall, these findings suggest that the fundamental determinants of protest participation are broadly shared across the population at large, and that the student sample is by no means special in this regard.

The independent explanatory power of individual factors Having found that several fundamental traits predict protest participation, we next ask which traits have the greatest explanatory power. To shed light on this question, we regress a protest participation indicator on each of the fundamental factors individually, estimating that factor's r-squared for small and large

protests, respectively. Alternatively, we calculate each factor's *marginal* r-squared, i.e. the incremental change in r-squared obtained after adding the factor to a regression containing all other explanatory variables. One can see in Table 1 that fundamental economic preferences are among the most important of the traits we analyze for both small and large protests: economic preferences are 4 of the top 7 predictors of small protest participation, and are 5 of the top 7 predictors of large protest participation. While personality traits play some role in explaining protest participation, we find almost no role of socioeconomic status (i.e., class) in predicting protest turnout.

Evaluating the truthfulness of responses to sensitive questions An important question regarding the interpretation of responses to direct questions about participation in an antiauthoritarian protest is whether students feel comfortable responding honestly to such a question. This used to be less of a concern in Hong Kong in the period studied, as noted above, given the legality of (and popular participation in) protests at the time of our surveys. However, we are able to evaluate whether students were actually willing to answer potentially sensitive political questions honestly in the HKUST student surveys.

To do so, we elicit a key dimension of political preferences — an expression of support for Hong Kong independence — that was legal at the time of the survey, but may have been considered sensitive. We measure levels of this support both directly (for a random subsample), and using "list experiments" (for another random subsample). The list experiment, or item count technique (Raghavarao and Federer, 1979), estimates support for a sensitive attitude by eliciting from control subjects the number of statements they endorse from a "control list" of four items. Treated subjects are asked to count the number of statements they endorse from a treatment list, which includes the four items in the control list, plus the (potentially) sensitive attitude. The difference in mean items supported between treatment and control subjects provides a "veiled" estimate of support for the sensitive item.

In Figure 4, we present population estimates of support for Hong Kong independence based on a direct question as well as estimates from our list experiment. One can see that there are statistically insignificant differences between these estimates for all survey years, and certainly no clear tendency for students to under-report this potentially sensitive position (if anything, in most

years support for independence is slightly higher when elicited directly). Political self-censorship seems not to have been prevalent in Hong Kong throughout the years of our surveys — both when protests were small and when they were large.

This has an important implication: a prominent theory of explosive protests is that they arise when individuals reveal their true opposition to the regime, no longer engaging in "preference falsification" (Kuran, 1997), thus inducing mass protest (e.g., due to strategic complementarity in protest participation). Our findings provide no reason to believe that small protests between 2016 and 2019 were a result of misperceptions about popular support for the antiauthoritarian movement; nor is there evidence that a shift away from preference falsification was at the root of Hong Kong's explosive 2019 protests.

5 Discussion

Protest participants, particularly those in mass protests, may appear to be disruptive and even anti-social. Our findings suggest that these individuals in fact are among society's most *pro*-social. While our findings are not definitive, they provide some guidance towards modeling the dynamics of protest participation. The prominent role of fundamental economic preferences, especially pro-sociality, in driving protest participation — both when protests are modest and massive — suggests that such behavior may be best thought of as the production of a political public good. Variation in turnout may reflect changes in the perceived benefits of the public good. In Hong Kong, the government's proposed extradition bill represented a clear threat to civil liberties, thus changing the nature of the political public good, and arguably stimulating the massive protest we study. Future work should develop and rigorously test more complete formal models linking economic preferences to the dynamics of protest behavior.

Work in other settings should also be done to determine the external validity of our findings. It is worth emphasizing that even though Hong Kong's mixture of freedom of expression and absence of genuine political representation in the period considered is unusual, it is not unique in a world increasingly characterized by "soft autocracies", rather than fully-fledged totalitarian dictatorships. Hong Kong's case is also an especially important one: antiauthoritarian protests in

Hong Kong have the potential to reverberate to Taiwan, and to mainland China, and thus have global repercussions.

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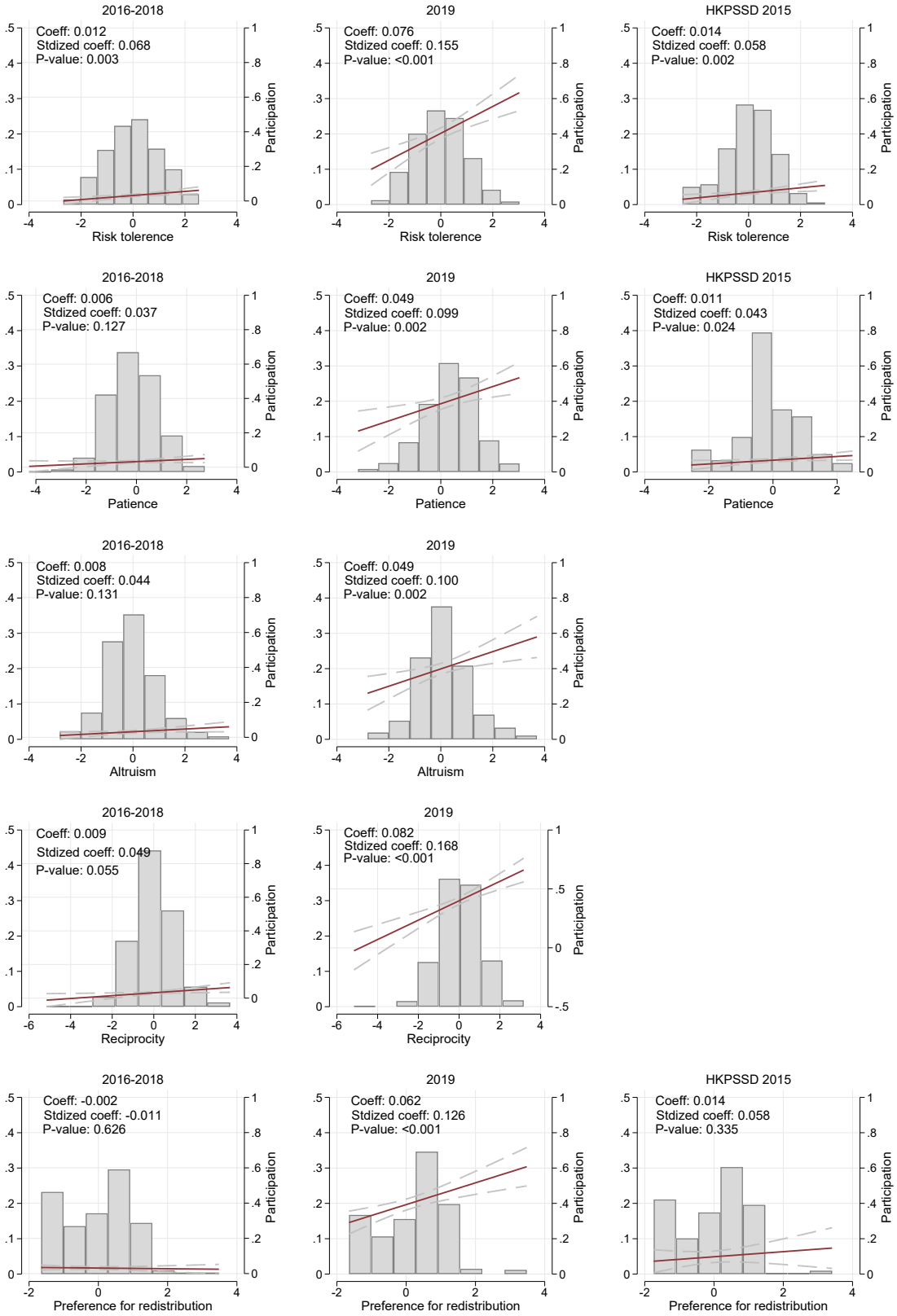


Figure 1: Figure presents the distributions of fundamental economic preferences as well as the relationships between these preferences and protest participation. Columns 1 and 2 present results from HKUST surveys, splitting the data between the 2016–2018 period (modest protests) and 2019 (massive protest). Column 3 presents results from the 2015 wave of the HKPSSD survey. All explanatory variables are constructed from several component survey questions, which are converted to standardized indices having mean zero and standard deviation of one (following Anderson, 2008). Figures plot regression lines and report coefficients ("Coeff") from univariate regressions predicting protest turnout as a dummy variable. They also report coefficients from regressions in which the protest participation outcome variable is standardized within each time period ("Stdized coeff").

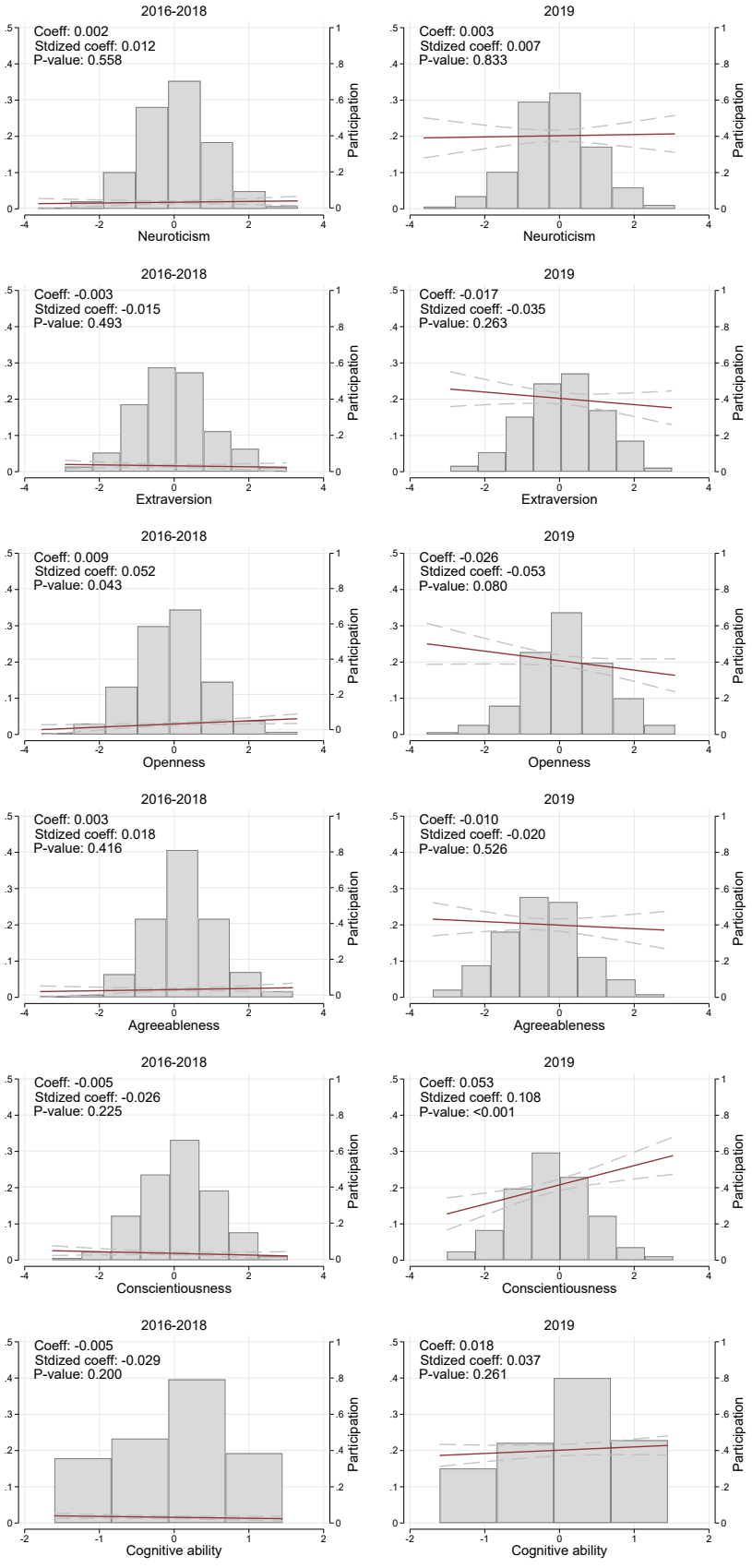


Figure 2: Figure presents the distributions of personality traits and cognitive ability as well as the relationships between these variables and protest participation. All data from HKUST surveys, splitting the data between the 2016–2018 period (modest protests) and 2019 (massive protest). All explanatory variables are constructed from several component survey questions, which are converted to standardized indices having mean zero and standard deviation of one (following Anderson, 2008). Figures plot regression lines and report coefficients ("Coeff") from univariate regressions predicting protest turnout as a dummy variable. They also report coefficients from regressions in which the protest participation outcome variable is standardized within each time period ("Stdized coeff").

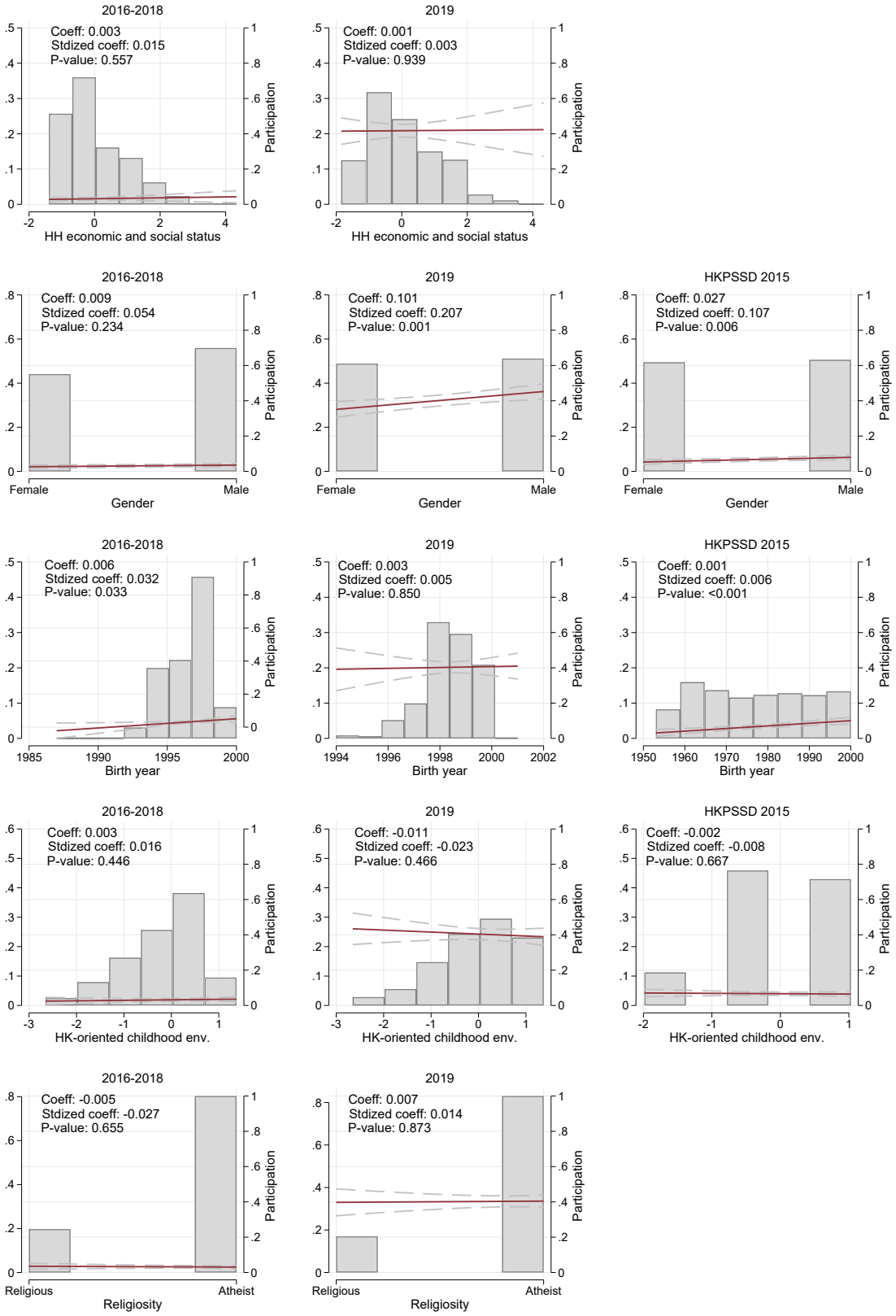


Figure 3: Figure presents the distributions of respondent demographics and socioeconomic backgrounds, as well as the relationships between these preferences and protest participation. Columns 1 and 2 present results from HKUST surveys, splitting the data between the 2016–2018 period (modest protests) and 2019 (massive protest). Column 3 presents results from the 2015 wave of the HKPSSD survey. Household socioeconomic status and respondents' childhood environment are constructed from several component survey questions, which are converted to standardized indices having mean zero and standard deviation of one (following Anderson, 2008). Figures plot regression lines and report coefficients ("Coeff") from univariate regressions predicting protest turnout as a dummy variable. They also report coefficients from regressions in which the protest participation outcome variable is standardized within each time period ("Stdized coeff").

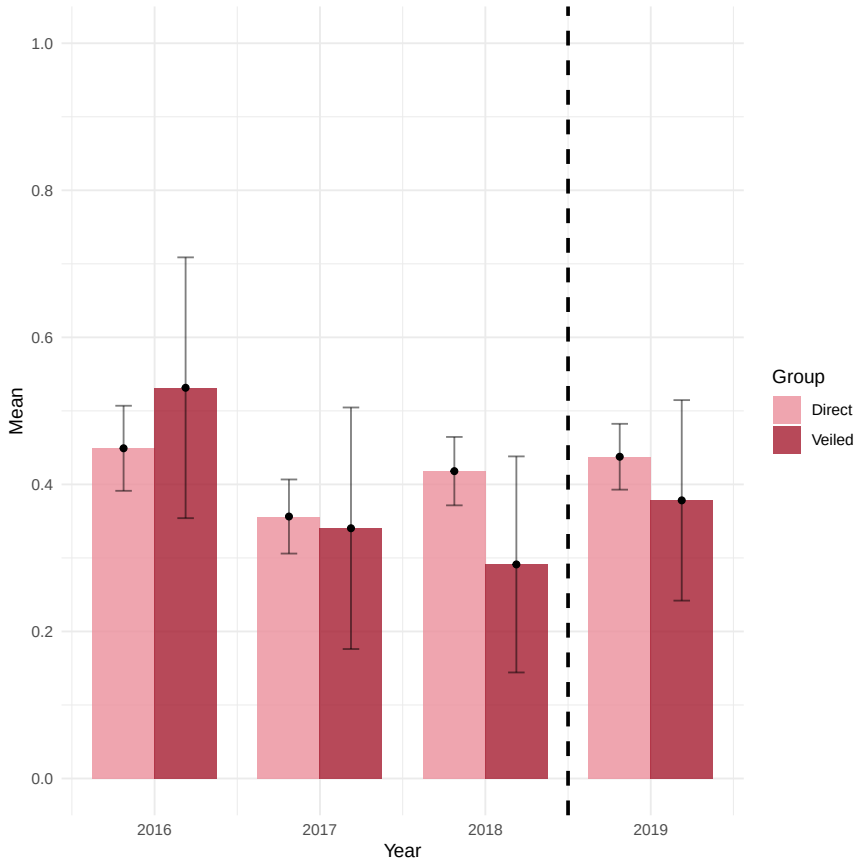


Figure 4: Figure presents population estimates of support for Hong Kong independence (and 95% confidence intervals) based on a direct question ("direct") as well as estimated support from a list experiment ("veiled"). Data come from HKUST surveys.

Table 1: Variance decomposition of protest participation

Categories	2016-2018		2019	
	Univariate R^2	Marginal R^2	Univariate R^2	Marginal R^2
All factors	0.0176	0.0176	0.0834	0.0834
Economic preferences	0.0072	0.0074	0.0523	0.0479
Risk tolerence	0.0047	0.0026	0.0225	0.0016
Patience	0.0013	0.0001	0.0099	0.0011
Altruism	0.0019	0.0003	0.0100	0.0008
Reciprocity	0.0023	0.0013	0.0286	0.0127
Preference for redistribution	0.0001	0.0014	0.0154	0.0096
Personality traits	0.0055	0.0064	0.0184	0.0176
Big 5 - neuroticism	0.0001	0.0002	0.0000	0.0040
Big 5 - extraversion	0.0002	0.0011	0.0014	0.0009
Big 5 - openness	0.0025	0.0009	0.0032	0.0002
Big 5 - agreeableness	0.0003	0.0011	0.0004	0.0054
Big 5 - conscientiousness	0.0007	0.0008	0.0127	0.0136
Cognitive ability	0.0009	0.0028	0.0013	0.0005
Background characteristics	0.0036	0.0051	0.0142	0.0183
HH economic and social status	0.0002	0.0004	0.0000	0.0098
Gender	0.0007	0.0010	0.0107	0.0114
Birth year	0.0024	0.0026	0.0000	0.0022
HK-oriented childhood env.	0.0002	0.0002	0.0006	0.0001
Religiosity	0.0001	0.0001	0.0000	0.0000
Obs.	2151	2151	950	950

Notes: Table presents variance decomposition exercise. Univariate R2 is the R-squared from a linear regression predicting protest particiaption using the factor indicated in each row. Marginal R2 is the incremental R-squared adding the single factor indicated in a given row to a regression model that already included all of the other factors listed. Each of the three categories' (Economic preferences, personality, and background characteristics) R2 aggregates the corresponding sub-category R2 values. Columns (1) and (2) present estimates for 2016–2018 protest turnout; columns (3) and (4) present estimates for 2019 protest turnout.

SUPPLEMENTARY APPENDIX, NOT FOR PUBLICATION

A Survey overview

A.1 Protest participation

Student surveys We asked students about their participation in the July 1 protest march in each year from 2016 to 2018. Literally, "Did you attend the July 1 201x March?" In 2019, we asked students whether they participated in the June 9, 2019, protest march. Responses were binary outcomes.

HKPSSD We asked respondents, "In the past 5 years, did you participate in any of the following?" Respondents then were asked to indicate whether they participated or not for each of the following events:

- Candlelight Vigil for June 4 Massacre
- 1 July Marches
- Anti-national Education
- Occupy Central Movement

Responses were converted into a binary outcome indicating participation in any of these protests.

A.2 Explanatory variables

The fundamental individual determinants of protest participation that we consider are: economic preferences, personality, cognitive ability, economic status, and background characteristics.

Economic preferences We elicit a complete profile of students' fundamental economic preferences, covering five dimensions: *(i)* risk preferences; *(ii)* time preferences; *(iii)* altruism; *(iv)* reciprocity; and, *(v)* preferences for redistribution.[1] We code these so that risk tolerance, patience, reciprocity, and a preference for greater redistribution are all coded as larger numbers. Time preferences, risk preferences, and preferences for redistribution were also elicited in the HKPSSD survey.

Risk tolerance

- Please tell me, in general, how willing or unwilling you are to take risks? (0 = completely unwilling to take risks; 10 = very willing to take risks)
- Certainty equivalent from step-wise lottery choices (what would you prefer: a draw with 50 percent chance of receiving 300 HKD, and the same 50 percent chance of receiving nothing, or the amount of xxx HKD as a sure payment?)

[1] Elicitation of risk preferences, time preferences, altruism, and reciprocity is based on Falk et al. (2018). We add an incentivized component based on Eckel and Grossman (2002) to their original risk preferences module (question C.1.3).

- Eckel and Grossman (2002) lottery decisions: for the following lottery options, please choose one that you like the most? *[incentivized]*

Patience

- How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future? (0 = completely unwilling; 10 = very willing)
- I tend to postpone tasks even if I know it would be better to do them right away (0 = describes me perfectly; 10 = does not describe me at all)

- Patience index from a step-wise intertemporal choices (would you rather receive 100 HKD today or xxx HKD in 12 months?)

Altruism

- How willing are you to give to good causes without expecting anything in return? (0 = completely unwilling; 10 = very willing)
- Today you unexpectedly received 10,000 HKD. How much of this amount would you donate to a good cause? (value between 0 and 10,000)

Reciprocity

- When someone does me a favor I am willing to return it (0 = describes me perfectly; 10 = does not describe me at all)
- I assume that people have only the best intentions (0 = does not describe me at all; 10 = describes me perfectly)
- When a stranger helps you, would you be willing to give one of the following presents to the stranger as a thank-you gift?
- How willing are you to punish someone who treats you unfairly, even if there may be costs for you? (0 = completely unwilling; 10 = very willing)
- How willing are you to punish someone who treats others unfairly, even if there may be costs for you? (0 = completely unwilling; 10 = very willing)
- If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so (0 = describes me perfectly; 10 = does not describe me at all)

Preference for redistribution

- Average amount of money allocated to a fellow HK local partner in a series of dictator games *[incentivized]*

Personality We elicit individuals' "Big 5" personality traits (Howard et al., 1996). Our survey included 25 questions measuring *(i)* neuroticism; *(ii)* extraversion; *(iii)* openness; *(iv)* agreeableness; and, *(v)* conscientiousness.

Big 5 - openness

On each numerical scale that follows, indicate which point is generally more descriptive of you:

- 1 = no-nonsense; 5 = a dreamer
- 1 = practical; 5 = theoretical
- 1 = following authority; 5 = following imagination
- 1 = seek routine; 5 = seek novelty
- 1 = prefer things clear-cut; 5 = comfortable with ambiguity

Big 5 - agreeableness

On each numerical scale that follows, indicate which point is generally more descriptive of you:

- 1 = abrupt; 5 = courteous
- 1 = selfish; 5 = generous
- 1 = cold; 5 = warm
- 1 = independent; 5 = team player
- 1 = skeptical; 5 = trusting

Big 5 - conscientiousness

On each numerical scale that follows, indicate which point is generally more descriptive of you:

- 1 = messy; 5 = neat
- 1 = open-minded; 5 = decisive
- 1 = easily distracted; 5 = stay focused
- 1 = comfortable with chaos; 5 = a preference for order
- 1 = procrastinate; 5 = on time

Big 5 - neuroticism

On each numerical scale that follows, indicate which point is generally more descriptive of you:

- 1 = calm; 5 = eager
- 1 = confident; 5 = cautious
- 1 = upbeat; 5 = discouraged
- 1 = don't give a darn; 5 = easily embarrassed
- 1 = unflappable; 5 = distractible

Big 5 - extraversion

On each numerical scale that follows, indicate which point is generally more descriptive of you:

- 1 = prefer being alone; 5 = prefer being with others
- 1 = pessimistic; 5 = optimistic
- 1 = private; 5 = exhibitionist
- 1 = cool; 5 = outgoing
- 1 = thoughtful; 5 = conversational

Cognitive ability We measure cognitive ability using the Cognitive Reflection Test (Frederick, 2005).

Cognitive reflection test

- A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?
- If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?
- In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

Economic status and background characteristics We measure HKUST students' economic status using a set of questions regarding their family's economic and social status. We also collect a range of individual demographic characteristics and indicators of students' childhood and household environments. Besides standard demographics (age and gender), we ask students whether they, their parents, or their grandparents were born in Hong Kong, and whether their parents currently reside in Hong Kong. To measure the degree of Hong Kong orientation (as opposed to China orientation) of students' high schools, we asked students whether their high school language of instruction was English. We also measure students' current cultural environment by asking them whether they are atheists or religious. Gender and the number of generations a respondent's family had lived in Hong Kong were also elicited in the HKPSSD survey (birth year was elicited as well, but is excluded from our comparisons, as the HKPSSD covers a very different set of birth years from the student sample, by design).

Economic status

Household economic & social status

- During the past 12 months, what's the average monthly income of your family?
- How many properties in HK do your parents currently own in total?
- Father's highest educational attainment is above high school?

- Mother's highest educational attainment is above high school?

Demographic characteristics

- Gender (0 = female; 1 = male)
- Birth year

HK-oriented childhood environment

- Generations since family migrated to HK (1 = self-migrated; 4 = great grandparents migrated)
- Attended HK high school using English as language of instruction?

Religiosity

- Religiosity (0 = atheist; 1 = religious)

A.3 Summary statistics

Table A.1: Summary statistics for HKUST sample (I): Economic preferences

Variable	Minimum	Maximum	Mean	SD
Economic preferences				
Risk tolerance				
Willingness to take risks	0	10	5.17	2.10
Choose the lottery you like most	1	5	3.23	1.48
Risk preference: certainty equivalent	1	32	11.70	6.87
Patience				
Willingness to give up sth. beneficial today to benefit more in the future	0	10	6.45	1.80
Tendency to procrastisnate	0	10	5.17	2.34
Time preference: future equivalent	1	32	19.00	11.46
Altruism				
Willingness to give to good causes without expecting anything in return	0	10	5.95	1.76
Donation amount (Today you unexpectedly received HKD 10,000...)	0	10000	2136.79	2372.37
Reciprocity				
Willingness to punish s.o. who treats you unfairly	0	10	5.35	2.19
Willingness to punish s.o. who treats others unfairly	0	10	4.85	2.02
When s.o. does me a favor, I am willing to return it	0	10	7.54	1.59
When I am treated very unjustly, I will take revenge at the first occasion	0	10	4.77	2.19
I assume that people have only the best intentions	0	10	5.01	2.04
Do you give one of the presents to the stranger as a 'thank-you'-gift?	1	7	4.12	1.77
Preference for redistribution				
Avg. passing in equity-efficiency game to parter from Hong Kong	0	1	0.32	0.19

Notes: Table presents summary statistics for HKUST student sample. N = 3101.

Table A.2: Summary statistics for HKUST sample (II): Personality

Variable	Minimum	Maximum	Mean	SD
Personality				
Neuroticism				
Big 5 - Eager	1	5	2.90	1.05
Big 5 - Cautious	1	5	2.98	1.00
Big 5 - Discouraged	1	5	2.96	0.92
Big 5 - Easily embarrassed	1	5	3.22	1.11
Big 5 - Distractible	1	5	3.04	1.04
Extraversion				
Big 5 - Prefer being with others	1	5	2.92	1.09
Big 5 - Optimistic	1	5	3.01	1.03
Big 5 - Exhibitionist	1	5	2.80	1.07
Big 5 - Outgoing	1	5	3.12	1.01
Big 5 - Conversational	1	5	3.01	1.02
Openness				
Big 5 - Dreamer	1	5	2.99	1.08
Big 5 - Theoretical	1	5	3.00	0.93
Big 5 - Following Imagination	1	5	2.95	0.92
Big 5 - Seek novelty	1	5	3.14	1.04
Big 5 - Comfortable with ambiguity	1	5	2.77	1.07
Agreeableness				
Big 5 - Courteous	1	5	3.38	1.13
Big 5 - Generous	1	5	3.01	0.91
Big 5 - Warm	1	5	3.04	0.93
Big 5 - Team player	1	5	3.05	1.01
Big 5 - Trusting	1	5	3.24	1.05
Conscientiousness				
Big 5 - Neat	1	5	3.19	1.02
Big 5 - Decisive	1	5	2.85	1.04
Big 5 - Stay focused	1	5	2.96	1.02
Big 5 - Preference for order	1	5	3.26	1.10
Big 5 - On time	1	5	3.23	1.16
Cognitive ability				
Quiz: Bat question correctly answered	0	1	0.29	0.45
Quiz: Lily question correctly answered	0	1	0.63	0.48
Quiz: Widget question correctly answered	0	1	0.71	0.45

Notes: Table presents summary statistics for HKUST student sample. N = 3101.

Table A.3: Summary statistics for HKUST sample (III): Demographics

Variable	Minimum	Maximum	Mean	SD
Demographics				
HH economic and social status				
Average monthly income of household during the last 12 months - imputed	500	62500	29368.30	17447.47
Parents' housing: How many properties owned in total?	0	6	0.81	1.00
Father's educational attainment above high school	0	1	0.30	0.46
Mother's educational attainment above high school	0	1	0.27	0.45
Gender				
Gender (0 = female, 1 = male)	0	1	0.54	0.50
Birth year				
Birth year	1987	2001	1997.13	1.69
HK-oriented childhood environment				
Generation in HK (1 = self, 2 = father, 3 = grandfather (father's side), 4 = earlier)	1	4	2.62	0.89
Language at high school was English (0 = no, 1 = yes)	0	1	0.81	0.39
Religiosity				
Not religious (0 = religious, 1 = not religious)	0	1	0.81	0.39

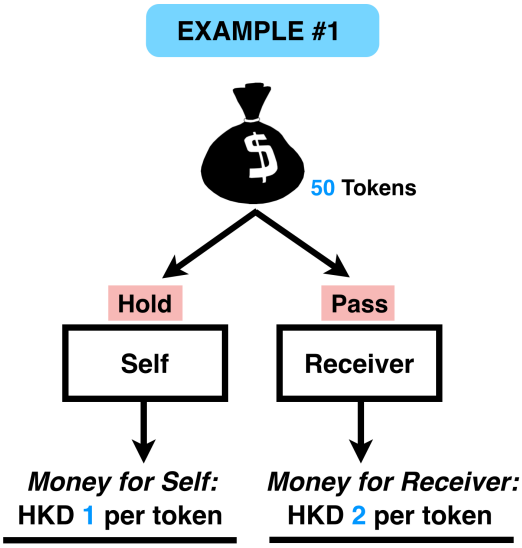
Notes: Table presents summary statistics for HKUST student sample. N = 3101.

Table A.4: Summary statistics for HKPSSD sample

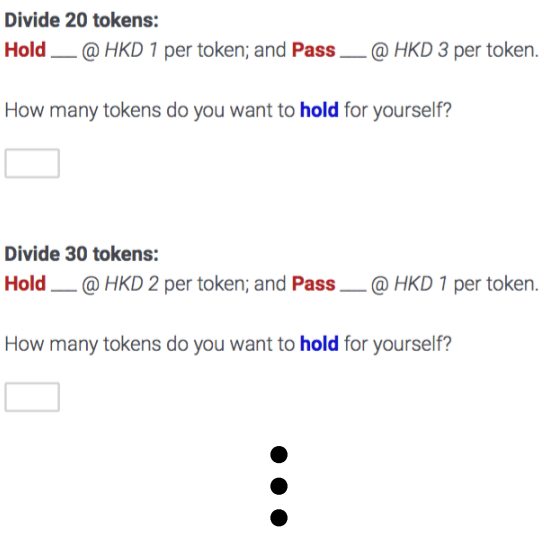
Variable	Minimum	Maximum	Mean	SD	N
Economic preferences					
Risk tolerance					
Willingness to take risks	0	10	5.18	2.00	2627
Risk preference: certainty equivalent	1	32	13.02	6.96	2627
Patience					
Willingness to give up sth. beneficial today to benefit more in the future	0	10	5.07	1.99	2627
Preference for redistribution					
Avg. passing in equity-efficiency game	0	0.96	0.32	0.19	327
Demographics					
Gender (0 = female, 1 = male)	0	1	0.51	0.50	2627
Generation in HK (1 = self, 2 = father, 3 = grandfather (father's side), 4 = earlier)	1	4	2.32	0.66	2627

Notes: Table presents summary statistics for HKPSSD sample.

B Dictator game instructions



Panel A



Panel B

Figure B.1: Instructions and actual interface for allocation decisions in the modified dictator game.

At the beginning of the component, you will receive **HKD 20**.

You are asked to decide whether you wish to **transfer** any amount of the HKD 20 to the Receiver assigned to you; and if so, how much. You will be able to **keep** the amount that you decide ***not*** to transfer to the Receiver.

You may also **receive money back from the Receiver**, as follows: We will **triple (3x)** the amount you transfer and give it to the Receiver; that is, for every HKD 1 that you transfer, the Receiver will receive HKD 3. In a few days time, we will ask the Receiver to decide if he/she wants to return any of the money that he/she received (i.e. 3x what you transferred) to you; and if so, how much. The amount he/she sent back to you will ***not*** be tripled.

Panel A

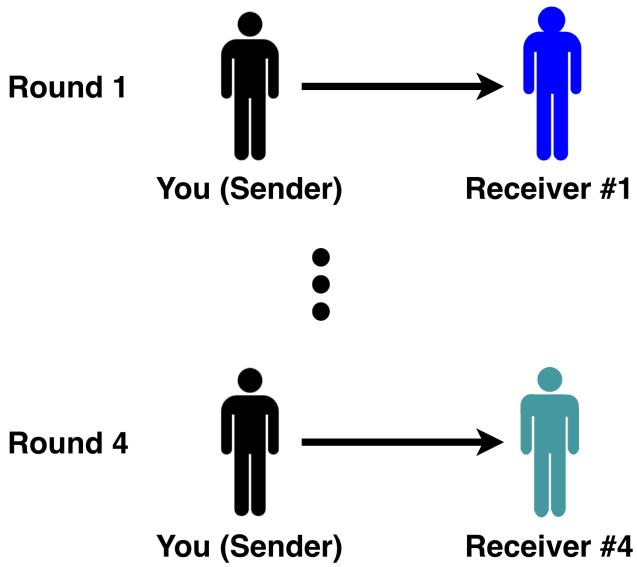
You are given **HKD 20**, and you can **transfer** any amount to the Receiver assigned to you.
We will **triple (3x)** the amount you transfer and give it to the Receiver.

In a few days time, we will ask the Receiver to decide if ${e://Field/Heshe_1} wants to **return** any of the money that ${e://Field/Heshe_1} received (i.e. 3x what you transfer) back to you.

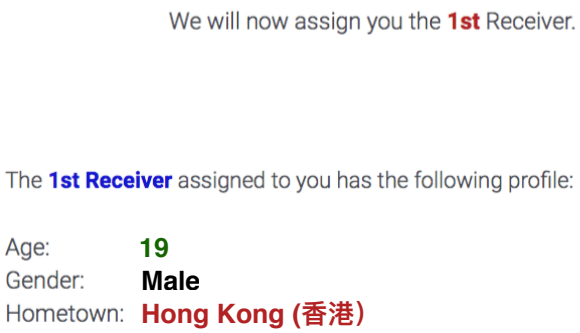
Now, please tell us, how much of the **HKD 20** do you wish to **transfer to the Receiver**?

Panel B

Figure B.2: Instructions and actual interface for allocation decisions in the trust game.



Panel A



Panel B

Figure B.3: Instructions and actual interface for randomly matched recipients in the lab games.

Additional References for Supplementary Appendix

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