Helping and Antisocial Behavior at the Workplace

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Abstract

We show that differences in employees' social preferences and personality traits, together with leadership, explain firm-level differences in helping and antisocial behavior at the workplace. Our results are based on matched employer-employee panel data that are representative of larger, private firms in Germany. The data utilize behaviorally validated survey items for measuring employee preferences and take account of a rich set of controls both on the employee and firm level. Our results corroborate the importance of social preferences and leadership for the observed heterogeneity in organizational culture between firms.

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1 Introduction

If employees help each other, firms can benefit (Hamilton, Nickerson, and Owan, 2003). If employees behave antisocially, this is harmful not only to employee motivation but also to firm performance (Gangadharan, Grossman, and Vecci, 2020). But what explains helping and antisocial behavior in firms, as well as the observed differences across firms? Why do some firms benefit from a high willingness among employees to help each other while other firms do not, or only less so? How important are employee personality types, as measured by the Big 5, or economic preferences in this relationship? And does "good" leadership promote helping and reduce antisocial behavior among employees?

In this paper, we analyze a unique, representative employer-employee panel data set of larger private establishments in Germany that is particularly appropriate to answer these questions.[1] First, our data contain explicit information from employees about mutual helping as well as antisocial behavior in their firm that allows us to construct reliable indices for both kinds of behavior at the firm level. Second, the data include established survey measures of employees' personality traits (Big 5, self-efficacy), quality of leadership (with focus on supervisor trust, understanding, and fairness), as well as economic preferences (social preferences, risk-taking, time discounting) that enable us to investigate to what extent differences along these dimensions explain differences in helping and antisocial behavior. Importantly, our preference measures are based on survey items that have been behaviorally validated for Germany, i.e., that are predictive for economically relevant behavior both at the individual and at the organizational level (cf. Falk et al. (2016, 2018) and references therein). Finally, we exploit a rich set of firm-level data to control for important differences in, for example, industry, firm size, or management practices (Bloom and Van Reenen, 2007). To the best of our knowledge, our study is the first to combine such rich and complementary employer-employee data to uncover the economic and behavioral foundations of helping and antisocial behavior at the workplace.

Our data cover the period from 2012 to 2019 in four survey waves, with about 800 to 1,200 firms participating in each wave. Information is based on both employer and employee surveys, the latter being administered to 37 employees on average, and 13 at the median, per firm. Since we are interested in helping and antisocial behavior in a given firm, we aggregate the data on the level of the firm, i.e., our units of observation are firm-level averages of a particular survey item in a given wave. To get closer to the causal effect of our measures on helping and antisocial behavior, we apply a lagged

[1] In our data, an establishment denotes a regionally and economically separate unit, in which employees liable to social security work (Fischer et al., 2009). In principle, a firm might therefore comprise of several establishments. For simplicity, we use the terms firm and establishment interchangeably throughout the paper, i.e., we always speak of firms on the establishment level.

dependent variable approach controlling for helping and antisocial behavior in the preceding wave.

Our results document a large variation in helping and antisocial behavior across firms covered in our sample. The distribution of helping is left-skewed, with the modal firm displaying a helping level of 4 (on a scale from 1 = "never or nearly never" to 5 = "always"). The distribution of antisocial behavior is right-skewed with a modal value of 2. As one might expect, helping and antisocial behavior are negatively correlated on the firm level, but the size of the correlation is modest ($\rho = -0.23$). In fact, there exists a sizable share of firms (41 percent) that show above-median levels in *both* types of behavior. Importantly, the data reveal that helping and antisocial behavior are significantly associated with key firm outcomes, both concerning employee welfare (such as job satisfaction, work engagement, turnover intention, and the number of sick days) and in terms of firm productivity (estimated based on the AKM model).

Concerning the factors explaining the observed variation across firms, we find that differences in social preferences and Big 5 personality traits of employees in a given firm play a major role. A 1 SD higher level of positive reciprocity is associated with a 0.13 SD increase in helping behavior. Similarly, a 1 SD higher level of employees' altruism is associated with a 0.08 SD increase in helping. For antisocial behavior, we find that a 1 SD higher level of employees' neuroticism is associated with a 0.14 SD increase in antisocial behavior. Intriguingly, social preferences, while significantly correlated with helping, do not explain antisocial behavior.

Besides employees' personality traits and social preferences, our results show that employees' trust and leadership quality are both significantly and economically meaningfully associated with helping and antisocial behavior. In fact, leadership, which in our context focuses on leaders' level of fairness, trust, and understanding towards their employees, tends to play the most important role in explaining firm-level differences of helping and antisocial behavior. A 1 SD increase in leadership quality is associated with a 0.16 SD increase in helping behavior and a 0.4 SD reduction in antisocial behavior, respectively. While our data control for a rich set of relevant human resource management (HRM) practices that could in principle also contribute to explaining the observed variation in behavioral outcomes, we dot not find any significant association of these measures with either helping or antisocial behavior in our sample.[2]

Our results connect and add to several strands in the literature. A classic stream of papers going back to at least Alchian and Demsetz (1972), Holmstrom (1982), FitzRoy and Kraft (1986), Drago and

[2]One possible reason could be that management practices, in particular compared to employee and leader personality styles, are highly endogenous and chosen optimally on the firm level. See, e.g., Demsetz and Lehn (1985) and Demsetz and Villalonga (2001) for related arguments in the context of firm ownership.

Turnbull (1988), Drago and Turnbull (1991), Itoh (1991, 1992), Kandel and Lazear (1992), and Rotemberg (1994) investigates the role of team production, mutual helping, and cooperation among workers, focusing largely on the design of incentives to induce efficient effort and production decisions.[3] Lazear (1989) also considers the problem of antisocial behavior between workers, such as sabotage. This important theoretical work has been complemented by a number of empirical studies analyzing the effect of incentives on teamwork and cooperation with single firm case studies or employer-employee data sets (Drago and Garvey, 1998; Knez and Simester, 2001; Berger, Herbertz, and Sliwka, 2011; Friebel et al., 2017; Deversi, Kocher, and Schwieren, 2020; Delfgaauw et al., 2021) or documenting differences in helping behavior between individual firms from a given industry (Gittell, Von Nordenflycht, and Kochan, 2004; Encinosa, Gaynor, and Rebitzer, 2007). Our study contributes to this literature by providing the first comprehensive empirical analysis of both helping and antisocial behavior at the workplace based on a representative sample of firms from a large economy including rich information on key firm- and employee-level variables. Besides employee incentives, our data consider robust information about employees' "cooperative attitudes" (agreeableness, social preferences) enabling us to address theoretical predictions of Lazear (1989) and Kandel and Lazear (1992) and more recently Kosfeld and von Siemens (2009, 2011).

With respect to employee attitudes, seminal research by Heckman, Stixrud, and Urzua (2006), Borghans et al. (2008), and Almlund et al. (2011) has shown that differences in personality traits, as measured by the Big 5, play a significant role in economic behavior, in particular in the labor market. We add to this research by showing that heterogeneity in the level of helping and antisocial behavior between firms can partly be attributed to personality differences in their respective workforce.

Becker et al. (2012) consider the role of economic preferences, as elicited in incentivized laboratory experiments, and find that measures of personality traits and economic preferences are rather complementary when it comes to explaining heterogeneity in economic behavior. Our results corroborate this view by identifying important empirical relations between personality traits and preferences on the one hand and helping and antisocial behavior on the other hand, while simultaneously control for the other construct. For example, our results show that social preferences (altruism, positive reciprocity) significantly explain helping, while personality traits contribute only little to this behavior. At the same time, personality (neuroticism) explains antisocial behavior, whereas economic preferences do not. This suggests that helping and antisocial behavior are rather different behaviors that are also influenced by different individual traits.

[3]Recent work includes Dur and Sol (2010) and Ishihara (2017).

With respect to interpersonal interactions at the workplace, a number of recent papers have emphasized the importance of workers' "social" or "people skills" for firm and labor market outcomes (Borghans et al., 2008; Borghans, Ter Weel, and Weinberg, 2014; Deming, 2017). Based on personnel data from a large US high-tech firm, Hoffman and Tadelis (2021) show that managers with higher employee ratings in "people management skills" are associated with lower employee turnover and rewarded for this in terms of higher promotion rates and larger salary increases. Our measure of leadership, considering a leader's fairness, trust, and understanding towards his or her employees, can be seen as a proxy for similar social skills of leaders to manage people in a given firm. Our results based on a representative sample of German firms add to these results by showing that good people management explain employees' mutual helping and antisocial behavior.

Finally, our results are related to the theoretical analysis of sorting and self-selection of employees with heterogeneous social preferences in the labor market (Kosfeld and von Siemens, 2009, 2011). While our data do not allow us to identify sorting behavior explicitly, Haylock and Kampkötter (2019), using the same data, show that the distribution of employee types across firms is consistent with self-selection according to employees' attitudes and preferences. Kosfeld and von Siemens (2009, 2011) then predict that firm outcomes in terms of cooperation and helping behavior among employees should differ, even within the same industry, and correlate with measures of social preferences on the firm level. This is exactly what the results in this paper show.[4]

The paper is organized as follows. Section 2 provides a detailed description of the data we use for our analysis. In Section 3 we document the evidence for helping and antisocial behavior across firms and show that both behaviors are significantly correlated with relevant firm outcomes. Section 4 contains our main empirical results as well as various robustness checks. Finally, Section 5 concludes.

2 Data

2.1 The Linked Personnel Panel

The data set we use is the Linked Personnel Panel (LPP), a longitudinal linked employer-employee data set, representative for German establishments in the private sector with at least 50 employees liable to social security (Kampkötter et al., 2016; Haylock and Kampkötter, 2019; Müller and Wolter,

[4]Other work documenting a positive association between social preferences and the level of cooperation in a natural field context includes Rustagi, Engel, and Kosfeld (2010). Krueger and Schkade (2008) show that workers who are more gregarious tend to be employed in jobs that involve more social interactions.

2020).[5] The LPP links employee-level information about individual job characteristics, preferences, attitudes, behavior, and personality traits to establishment-level information on a variety of firm variables, including management practices. We analyze the four survey waves of the LPP from 2012/13, 2014/15, 2016/17, and 2018/19.

The employer survey covers between 769 and 1,219 establishments per wave, which are randomly drawn from the IAB establishment panel, a large-scale annual survey of nearly 16,000 German establishments. The employer sample is drawn in a disproportionate stratified manner by establishment size, federal state and business sector to ensure the sample is representative. The employee survey is based on administrative data of the social security registration, which avoids typical effects of selectivity normally found in survey data. A stratified random sample of employees working within the surveyed establishments (roughly between 6,500 and 7,500 individuals per wave aged between 18 and 74) are interviewed at home via telephone (CATI) or web interface (CAWI). It is important to note that interviews take place outside the work environment at home, typically in the evening. This ensures that LPP employee survey respondents working in the same firm are interviewed independently of each other. In both surveys, response rates are comparatively high (79% for the employer and 57% for the employee survey on average). We do not find significant selection effects on panel participation. For a detailed description of the design of the data set and the sources of the applied constructs see Kampkötter et al. (2016).

The main quality of the LPP data comes from the careful implementation of both surveys (ensuring random selection and representativity) as well as the use of established survey items for each relevant firm- or employee-level variable. This implies that our data is necessarily limited in other aspects. For example, with less than 40 employees participating on average in each wave the data can only provide repeated snapshots from each firm, which reduces the possibility to dig deeper into differences (as well as determinants) of helping and antisocial behavior on the individual or team level *within* a given firm. We account for this by aggregating all information on the firm level, thereby taking implicitly an organizational culture perspective that focuses on the variation between firms spanning many industries.

[5] Agriculture, forestry, and fishery are not included in the data. The data set is open to any researcher and is available via the Research Data Centre (FDZ) of the German Federal Employment Agency at the Institute for Employment Research (IAB). The DOI is: 10.5164/IAB.LPP1617.de.en.v1.

2.2 Helping and antisocial behavior

We use data from individuals i in a firm f at survey wave t on helping and antisocial behavior to construct our main outcome variables. We observe a random sample of multiple employees per firm and wave, and aggregate the individual data to firm-wave-averages, denoted by $HELP_{f,t}$ and $ASB_{f,t}$. We calculate these firm-wave averages for establishments with at least three observations per wave.[6] This reduces measurement error that may occur at the individual level, such as common method bias, where left- and right-hand-side variables originate from the same survey. Measurement error could also arise if firms encourage employees to give high ratings. However, since the employee survey is always answered privately at home, i.e., outside of the workplace, we expect this measurement error to be generally small in our data.

Helping is measured with two items from the LPP employee survey: offering help to colleagues (*"How often do you offer your colleagues help?"*), and receiving help from colleagues (*"How often do you receive support or help from your colleagues if you ask?"*). Based on these items, we generate a helping index, which is the equally-weighted average of help received and help offered of a respondent i in survey wave t. As a further dependent variable we use a survey item on antisocial behavior by colleagues and superiors (*"How often do you feel wrongly criticized, harassed or denounced by your colleagues or superiors?"*). Both measures of help received and antisocial behavior are based on the Copenhagen Psychosocial Questionnaire (COPSOQ), which has been used in more than 40 countries worldwide (Burr et al., 2019). For all three items, a 5-point Likert scale is applied with the following response categories ranging from 1 to 5: "never or nearly never", "seldom", "sometimes", "often", or "always". Helping and antisocial behavior are asked repeatedly over all four survey waves of the LPP. We standardize all variables with zero mean and unit variance prior to entering the regressions.

We justify the combination of the two helping items into one helping index by their strong positive correlation. The Spearman correlation coefficient between help offered and help received at the *individual level* across all waves is 0.54 and significant at the 1% level. The relationship remains very stable over time, ranging from 0.51 to 0.55. Descriptively, a large amount of respondents engage in mutual help, i.e. they offer help when asked *and* receive help if they ask for it.[7] Since individual helping behavior is closely linked to the helping behaviors of those an employee interacts with, the

[6] The number of employees who are randomly sampled within each firm is increasing in firm size. At the 10th percentile, we observe about 5 employees per establishment-wave cell, at the 50th percentile 13, at the 90th percentile 45, and at the 99th percentile 446 employees. The average number is 37.

[7] For example, in 86.4% of person-year observations, employees state that they offer help to their colleagues "always" or "often" (level 4 and 5, respectively). In 85.5% of person-year observations, employees state that they are helped by their colleagues "always" or "often" if they ask. With respect to the combined helping index we find that employees show a value of at least 4 in 82% of person-year observations.

average of both items per individual and then firm can be interpreted as a descriptive helping norm on the firm level.

The Spearman correlation between our helping index and antisocial behavior at the individual level is significant at the 1% level, but at a rather modest level of -0.25 across all waves. This correlation is again stable over time, ranging from -0.23 to -0.26, all significant at the 1% level. Thus, while related, both constructs do seem to measure somewhat different parts of interpersonal behavior and are not mirrors of one another.

2.3 Explanatory variables

With respect to explanatory variables, we focus on three main potential channels: (i) Employee personality traits, (ii) economic preferences, in particular, social preferences, and (iii) leadership quality. Our measures for each of these channels are based on a rich set of validated and commonly used constructs, either from experiments, surveys, or management research (Patterson et al., 2005; Kim and Leung, 2007; Falk et al., 2016, 2018). In this section, we describe these measures in detail and document their source. An overview on all employee- and firm-level survey items used as dependent and independent variables including their original wording is presented in Tables A.1 and A.2 in the Appendix.

2.3.1 Personality

To assess an employee's personality, we apply the Big 5 personality traits (Costa Jr and McCrae, 1995) and self-efficacy (Bandura, 1977, 1997). The former are measured by the Big 5 inventory short scale (16-item variant) as in the German Socio-Economic Panel (SOEP) (Gerlitz and Schupp, 2005). This scale has been used successfully, for instance, by Dohmen et al. (2008, 2010) and Becker et al. (2012). Self-efficacy is elicited by the ASKU self-efficacy scale from Beierlein et al. (2013), which includes three items measured on a five-point Likert scale. Personality traits and preferences are only asked once when an employee is surveyed for the first time, as these variables are considered to be rather time-constant. For our regression analyses, we impute these values into all subsequent waves where the same individual is observed.

2.3.2 Economic preferences

Based on prior literature, we apply a set of economic preferences commonly used in behavioral economics research (Becker et al., 2012; Falk et al., 2016) that have been behaviorally validated for

Germany both in the lab and in the field. We elicit positive and negative reciprocity (Dohmen et al., 2009) by two items from the Preference Survey Module (PSM) of Falk et al. (2016), with one item also used in the SOEP. Altruism is similarly elicited by a single item from the PSM. Inequity aversion is operationalized by using two items from the Justice Sensitivity Inventory short scale USS-8 (Schmitt et al., 2010; Beierlein et al., 2012). In detail, we take one item from the victim and one item from the beneficiary scale that reflect disadvantageous and advantageous inequity. We measure trust by two of the three items that are commonly used in the SOEP (Dohmen et al., 2008; Naef and Schupp, 2009). Risk attitude is measured using a single SOEP item that has been shown to predict risk-taking in experimental lottery choices (Dohmen et al., 2011). Finally, time preferences measure how much respondents are willing to give up today so they can afford more tomorrow, and how much they engage in procrastination. These items are also based on the PSM (Falk et al., 2016).

2.3.3 Leadership

We use employees' assessment of leadership quality in their organization to predict helping and antisocial behavior. We proxy good leadership by constructing an equally-weighted leadership index based on three items: two items (supervisor trust and supervisor understanding) are derived from the perceived supervisory support scale of the well-established Organizational Climate Questionnaire (Patterson et al., 2005) and one item (supervisor fairness) is taken from the interactional justice scale (Kim and Leung, 2007). Similarly to Hoffman and Tadelis (2021), we average this leadership index in a firm f at wave t to get an aggregate level of leadership quality per firm-wave cell.

2.3.4 Control variables

Our set of base controls includes education dummies, measured in six school education categories (no school certificate, Hauptschule (9th grade), Realschule (10th grade), university of applied sciences entrance qualification (Fachhochschulreife), higher education entrance qualification (Abitur), and other) and seven vocational and university educational categories (none, apprenticeship, trade school, master craftsman, university of applied sciences degree, university degree, and other). In addition, we control for gender, age categories (under 30, 30 to 40, 40 to 50, and over 50), an indicator for having a life partner, an indicator for living alone, task interdependencies (elicited by two items asking whether an employee's tasks are depending on the input of colleagues and whether colleagues' tasks are depending on an employee's own task fulfillment), an interview method dummy (telephone interviews (CATI) vs. web-based interviews (CAWI)), fixed effects for survey wave, industry (manufacturing;

metal electronics and automotive; retail, logistics, and media; company-related and financial services; IT, communication, and other services), region (east, south, north and west), establishment size (under 50 employees, 50 to 99 employees, 100 to 249, 250 to 499, and above 500)[8], and ownership type (family firm, management, investor or dispersed ownership, (partly) state-owned, other ownership type). All these base control variables are included in every regression specification.

A further set of job controls includes the logarithm of the monthly net wage, a white collar indicator, a management position indicator, a part-time indicator, and a fixed-term work contract indicator. These job controls are only included in some specifications due to their potentially endogenous character.

2.3.5 Human resource management practices

The above-described personality traits and economic preferences of employees are almost by definition stable and difficult to affect by an organization. Equally, it is hard to change the leadership style of managers fundamentally. In contrast, firms can more easily adjust human resource management practices. Because they are endogenous, the interpretation of any link between human resource management practices and our outcome variables helping and antisocial behavior is difficult to interpret. Further, following the arguments in Demsetz and Lehn (1985) and Demsetz and Villalonga (2001), we would expect there to be no significant link at all if management practices are chosen optimally in our sample of firms. Specifically, if management practices were chosen optimally, any variation in outcomes would come from the error term and should not be correlated with the management practices. Intuitively, if, for example, team performance pay systematically improves helping, then why do not all firms adopt this management practice? In the following, we treat our measures of human resource management practices as additional control measures. This link between employee-level information from the employee survey and establishment-level information from the employer survey enables us to rule out that, e.g., incentive effects from contracts or performance feedback are omitted variables, otherwise linked both to explanatory and outcome variables.

In our data, establishment managers provide information about the use of HRM practices in each wave of the employer survey. These items closely follow the spirit of recent, large-scale management surveys such as the World Management Survey or the Management and Organizational Practices Survey (Bloom and Van Reenen, 2007, 2010; Bloom et al., 2010, 2013; Bender et al., 2018; Bloom

[8]Some of the smallest establishments may shrink in size over time and are then allocated to the category "under 50 employees".

et al., 2019). We include dummy variables for the existence of performance appraisal systems, written target agreements, employee feedback talks, (career) development plans, annual employee surveys, the use of a code of conduct, and the importance of a good working atmosphere for retaining employees. We further control for an index variable called consequence management, which is the equally-weighted average of four items measuring the way in which poor performance is addressed and the type of consequences that result from persistent underperformance.

Finally, a potentially relevant management practice is performance pay. We construct variables both for managerial and non-managerial employees taking the value one if the firm uses variable pay that depends on firm performance and/or team performance and/or individual performance, and zero otherwise. We also control for the share of non-managerial staff that receive performance pay to proxy for the general importance of incentive pay in a given firm.

3 Helping and antisocial behavior across firms

In this section, we start by documenting the evidence for helping and antisocial behavior across firms based on our representative data. We also show that both types of behavior are significantly associated with important firm-level outcomes such as job satisfaction, affective commitment, turnover intention, and establishment productivity.

3.1 Descriptive statistics

Figure 1 shows the distribution of firm-wave averages of our helping index, the single items on help offered and help received, as well as antisocial behavior. The distribution of the helping index and the underlying helping items is left-skewed, with the modal firm lying between 4 ("often") and 5 ("always"). Importantly, the graphs show that there is quite some heterogeneity across firms. For antisocial behavior, the distribution is right-skewed and most firm averages range between 1 (never or nearly never) and 2 (seldom).[9]

Helping and antisocial behavior are negatively and significantly correlated at the firm level but as we saw already at the individual level, the size of the correlation is rather modest (Spearman

[9] In Figures A.4 and A.5 in the Appendix, we show the distributions of the helping index and antisocial behavior by wave. For helping, Kolmogorov-Smirnov tests reveal significant differences wave-on-wave between waves 1 and 2 ($p < 0.0000$), as well as between waves 3 and 4 ($p < 0.0000$). The difference in distributions between waves 2 and 3 is not statistically significant ($p = 0.850$). The data show that helping cultures are becoming more heterogeneous in the population of firms over time. For antisocial behavior, we observe a similar pattern, where the distribution significantly changes from waves 1 to 2 ($p = 0.081$), and from waves 3 to 4 ($p < 0.000$), but stays similar from waves 2 to 3 ($p = 0.349$).

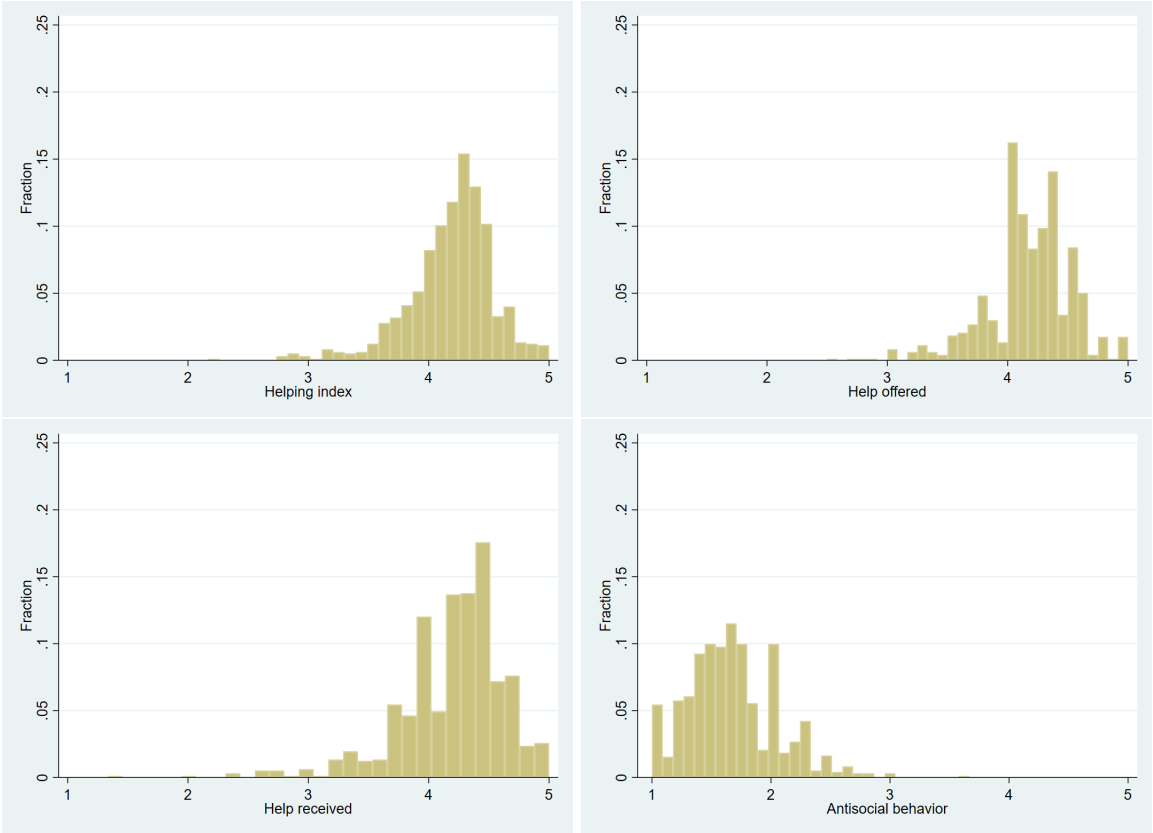


Figure 1: Distribution of establishment-wave averages of the helping index, help offered, help received, and antisocial behavior. Source: Linked Personnel Panel, waves 2 to 4 (regression sample). Survey items are shown in Table A.1. N=973 per histogram. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell.

$\rho = -0.23$ across all waves, $p < 0.0000$). Table A.4 in the Appendix shows a contingency table of median splits for helping and antisocial behavior at the firm-wave level to identify different clusters of firms. The analysis reveals that in firms where helping is above the median, it is more likely for antisocial behavior to be below median, and vice versa (Pearson Chi-squared and Fisher's exact tests significant at $p < 0.000$). Nevertheless, in 41 percent of the firm-year observations in which helping is above median, antisocial behavior is also above median. Figure 2 shows a scatter plot of both outcome measures to support this.

We provide further information on descriptive statistics at the establishment-wave level of all variables used in our main analyses in the Appendix. See Tables A.1 to A.7 and Figures A.1 to A.13.

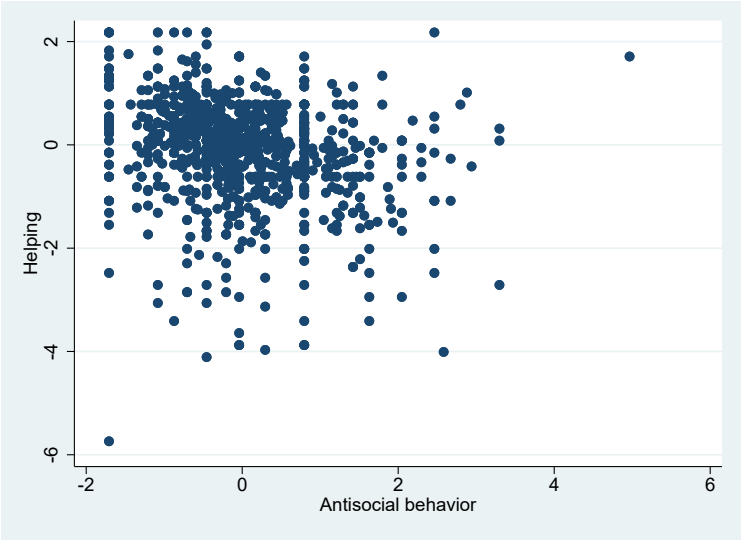


Figure 2: Scatter plot between helping index (std.) and antisocial behavior (std.) at the firm-wave level. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items are shown in Table A.1.

3.1.1 Association with firm and employee outcomes

Are helping and antisocial behavior associated with relevant firm-level outcomes? This subsection shows that the answer is yes and, hence, motivates the relevance of our key variables of interest. We focus on a series of outcome variables that are commonly used in the literature, namely employees' job satisfaction, affective commitment, work engagement, turnover intention, and sickness days. Finally, we also consider establishment productivity.

We elicit these outcome measures in the following manner. Work engagement is based on the internationally validated Utrecht Work Engagement Scale-9 by Schaufeli and Bakker (2003). Affective commitment is measured using the six-item short scale by Meyer, Allen, and Smith (1993). Job satisfaction and the number of sick days are elicited by single survey items from the SOEP. Turnover intention is measured by a single item also used in a series of other surveys such as the COPSOQ survey or the German Study on Mental Health at Work (S-MGA) (Bluedorn, 1982; Rose et al., 2017; Burr et al., 2019). All these individual-level outcomes are elicited in every survey wave. As our unit of observation is an establishment in a given survey wave, we calculate establishment-wave averages of all individual-level variables. Furthermore, we standardize all variables with zero mean and unit variance.

With respect to establishment productivity we follow the estimation strategy proposed by Abowd, Kramarz, and Margolis (1999). This AKM approach has been recently used also by, for

instance, Bender et al. (2018), Bloom et al. (2018), and Song et al. (2019).[10] Here, the log daily real wage of an individual in a time period is decomposed into an unobservable worker effect, an unobservable establishment effect, time-varying observable worker characteristics, and a residual. The unobservable establishment fixed effect, which represents an efficiency wage premium or rent sharing, denotes our outcome variable of interest.

Table 1 documents the relationship between our two variables of interest, helping and antisocial behavior, and the relevant firm-level outcomes. Panel A shows a consistent pattern, where helping is significantly positively related to all employee outcome variables except the number of sick days. We also document a positive correlation between the level of helping and establishment productivity. Antisocial behavior is negatively correlated with engagement, commitment, and job satisfaction, as can be seen in Panel B. Furthermore, antisocial behavior is positively related to turnover intention and the number of sick days. Overall, these results support the relevance of helping and antisocial behavior in firms, as these constructs are sizeably related to well-established organizational outcomes.

Table 1: Mutual helping, antisocial behavior, and organizational outcomes

	(1) Engagement	(2) Commitment	(3) Job Satisfaction	(4) Turnover intention	(5) Sick Days	(6) Establishment productivity
			Panel A: Helping			
Helping	0.20***	0.21***	0.29***	-0.17***	-0.02	0.06***
	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.02)
All controls	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.18	0.25	0.21	0.17	0.09	0.61
Obs.	973	973	973	973	973	1,003
			Panel B: Antisocial behavior			
Antisocial behavior	-0.18***	-0.23***	-0.40***	0.32***	0.10***	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
All controls	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.17	0.26	0.28	0.24	0.10	0.61
Obs.	973	973	973	973	973	1,003

This table shows regressions of several employee outcomes on mutual helping and antisocial behavior. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). The dependent variables in columns 1 to 5 are standardized firm-wave weighted averages of employee outcomes. In column 6 the dependent variable is the standardized AKM firm fixed effect estimated using the LIAB data as estimated from 2010 to 2017. The sample used is the main regression sample in columns 1-5, and the sample used in column 6 is collapsed at the firm level over time, since the AKM FE is only measured once per firm over the sample period, additionally including wave 1 observations. Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Standard errors (clustered on the establishment level) are reported in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

[10]The (extended) establishment fixed effects we use cover the period 2010-2017 and are based on the IAB Employment History File, as described in Card, Heining, and Kline (2013) and Bellmann et al. (2020) Detailed information about the LPP-ADIAB is provided via DOI: 10.5164/IAB.FDZD.1907.en.v1.

4 Explaining firm-level differences

We now come to our main question and results: What explains firm-level differences in helping and antisocial behavior documented in the previous section? In the following, we first discuss potential channels through which differences in individual personality traits, economic preferences, as well as leadership might influence both behaviors. Subsequently, we present our empirical strategy, followed by the main results and robustness checks.

4.1 Determinants of helping behavior

4.1.1 Personality traits

Our first set of hypotheses addresses the composition of the Big 5 personality traits and self-efficacy in the firm, and their relation to helping behavior. We hypothesize that the facet agreeableness is positively related to helping behavior, as agreeableness is overall a personality measure that captures cooperative tendencies. This has been shown in the lab, e.g., by Kagel and McGee (2014) and Proto, Rustichini, and Sofianos (2019). Further, because neurotic individuals may be concerned overly with envy, be insecure, and also overly concerned with themselves, this likely reduces helping behavior. Conscientious individuals, who are concerned with doing a thorough job, and working hard may be more likely to provide help when asked. Self-efficacy measures self-reliance, which may be linked to asking for less help. However, we see no direct link to helping here.

4.1.2 Economic preferences

Based on the theoretical arguments in Kosfeld and von Siemens (2009, 2011) and the empirical findings in Rustagi, Engel, and Kosfeld (2010), we expect a significant relation between employees' economic preferences, in particular social preferences, and helping behavior across firms. There is ample laboratory evidence showing a relation between group formation, group social preferences, and voluntary cooperative outcomes (Gächter and Thöni, 2005; Brekke et al., 2011; Özgür Gürerk, Irlenbusch, and Rockenbach, 2014). One finding is that, where possible, prosocially oriented individuals self-sort together (Brekke et al., 2011; Özgür Gürerk, Irlenbusch, and Rockenbach, 2014). Second, groups of prosocially oriented individuals show greater, and more persistent cooperation (Gächter and Thöni, 2005; Brekke et al., 2011). We measure preferences that are broadly in line with a prosocial orientation, which we relate to our first outcome - the average level of mutual help in an establishment.

Positive reciprocity generally describes the willingness to return a favor; see, e.g. Dohmen et al. (2009). In firms where there are more positively reciprocal types, we expect more mutual help, as here the workers may be more willing to return the helping favor when asked. In contrast, negative reciprocity might generally show no theoretical relation to helping behavior, since it is the willingness to take revenge when treated unjustly, not for "not being helped".

Altruism can be clearly linked to many kinds of prosocial behavior (Andreoni, 1990; Fehr and Fischbacher, 2003) and helping, independent of whether help is given or received. We therefore expect a strong positive link between altruism and average firm helping.

Various strands of literature predict that trust increases cooperation, in general and in organizations (see, e.g., La Porta et al. (1997) and references therein). Trust is different to the above social preferences, as it additionally captures the beliefs of an individual about being able to rely on others, but also betrayal aversion (Fehr, 2009). There could be many potential channels through which this positively influences helping behavior. For example, trusting others may be necessary to offer help, if one expects help to be returned. Another leading example could be trusting others to do the work properly if one asks for help. Further, belief in reliable colleagues, could also be a signal of believing that teamwork can function well. Thus, we expect greater trust to be significantly related to greater helping, on average.

4.1.3 Leadership

We expect to see a strong positive link between our leadership measure and helping behavior, as leaders have been shown to play an important role in inducing and maintaining cooperation among followers (Kosfeld, 2020). For example, leaders may coordinate employees who have prosocial preferences but do not believe that others do too (Gächter et al., 2012). They can also signal via leading-by-example that this is credible behavior, i.e., by helping others herself (Hermalin, 1998; Potters, Sefton, and Vesterlund, 2007). In addition, leaders may sustain helping equilibria through punishing defectors and rewarding the helpers. Better leaders are expected to punish more fairly (Kosfeld and Rustagi, 2015).

4.2 Determinants of antisocial behavior

4.2.1 Personality traits

Our second set of hypotheses concerns average firm-level antisocial behavior. Soft skills, like the Big 5, have shown to affect life outcomes and labor market outcomes (Heckman and Kautz, 2012).

Neuroticism is a likely candidate to influence the level of antisocial behavior in a given firm, since it could easily be the cause of misunderstandings between employees. Greater agreeableness, on the other hand, seems likely to be associated with less antisocial behavior.

4.2.2 Economic preferences

Social preferences seem differently linked to antisocial behavior than to helping at a first glance. In particular, since antisocial behavior is not just the absence of helping, we may not make the same hypotheses in the other direction. If anything, we might expect that negative reciprocity is correlated with antisocial behavior, for example, if employees (mis)perceive a colleagues' behavior as unfriendly and react correspondingly.

The absence of trust in the firm can lead to large amounts of antisocial behavior among all. For example if an employee misunderstands her colleague and responds in a disrespectful fashion, this could lead to a vicious cycle of antisocial behavior. Thus, distrustful employees will likely cause an increase in antisocial behavior on average.

4.2.3 Leadership

Here we expect good leaders to be associated with less antisocial behavior at the workplace. This can potentially happen through multiple channels, e.g. punishing those who misbehave, or rewarding good behavior (Kosfeld, 2020). Generally, creating a good team climate can reduce antisocial behavior among employees, too. In addition, our measure of antisocial behavior includes being mistreated by the superior, so leadership quality should also have a direct impact on the perception of antisocial behavior.

4.3 Empirical strategy

Our main specification regresses the standardized outcome variable (helping or antisocial behavior) in a firm f at wave t on firm-level averages of our independent variables at wave t. Unless stated otherwise, all continuous independent variables are standardized firm-wave averages. All our regressions are OLS regressions that are analytically weighted by the number of observations per firm-wave cell, and standard errors are clustered at the firm level. We apply a lagged dependent variable (LDV) approach

and estimate the following regression equation:

$$Y_{f,t} = \alpha + \beta Y_{f,t-1} + \beta BASECONTROLS_{f,t} + \beta PERSONALITY_{f,t} + \beta PREFERENCES_{f,t} + \beta LEADERSHIP_{f,t} + \beta PRACTICES_{f,t} + \beta JOBCONTROLS_{f,t} + \theta_t + \varepsilon_{f,t}.$$

By controlling for the lag of the dependent variable, $Y_{f,t-1}$, we mitigate a potential omitted variables and reverse causality problem and move closer to causality. The LDV method allows us to control for historical factors that cause current differences in our dependent variables, helping and antisocial behavior. For instance, some firms have had high helping levels in the past, most likely due to selection of more cooperative types into single firms in periods prior to our observation period. If two firms have the same previous level of helping (in period $t-1$) and current level of all independent variables other than, for instance, trust (i.e., do not differ in size, industry, region, gender composition, age structure, etc.), then the coefficient of trust measures the ceteris paribus effect that a more trusting firm environment has on the level of mutual cooperation or antisocial behavior across our sample of firms.

We add explanatory variables to each specification in a step-wise fashion: In column 1 of each table, the dependent variable is regressed on the vector of exogenous control variables ($BASECONTROLS_{f,t}$) as well as the lag of the dependent variable ($Y_{f,t-1}$). Remember that all included base controls are determined prior to the realization of our independent variables of interest, or are stratification controls and, hence, can be considered exogenous. In column 2, we include the Big 5 personality traits and self-efficacy ($PERSONALITY_{f,t}$). Column 3 additionally includes all individual economic preferences ($PREFERENCES_{f,t}$). The firm-wave averages of personality as well as preferences, can change over time in our main specification due to composition effects, as some workers leave the survey and are replaced by a new individual.[11] In column 4, we additionally include our leadership index ($LEADERSHIP_{f,t}$).

By adding these variables in a step-wise manner we test whether they have additional explanatory power to already included predictors. One question could be if economic preferences explain additional variation in the data once personality traits have already been accounted for. And related, is there any incremental value of adding leadership quality to such an estimation model? This type of analysis also shows whether different constructs such as personality traits, economic preferences or

[11] In a robustness check, we drop refreshers to ensure that the results are not driven by newly interviewed workers. Note that these are not necessarily newly employed workers, but just newly surveyed employees, as a result of panel attrition.

leadership quality are complements or rather substitutes (Becker et al., 2012).

In column 5, we add the set of HRM practices ($PRACTICES_{f,t}$) and job controls ($JOBCONTROLS_{f,t}$). Management practices and job controls are only included at this later point because they are potentially endogenous, i.e., these variables themselves might be an outcome of a specific composition of traits and preferences in a given firm. For instance, being in a management position might be an outcome of employees having certain personality traits and preferences such as risk aversion, although this endogeneity problem might be less severe when looking at firm averages only.

Finally, in column 6, we also include the lagged value of the other outcome variable of interest as control variable, as helping and antisocial behavior are weakly related. Since preferences and other explanatory variables are correlated with helping, and helping is also correlated with antisocial behavior, we test whether this reduces a potential omitted variable bias.

4.4 Helping

Table 2 contains our results on helping. Column 1 shows that helping is quite persistent on the firm level, and 19% of the total variation can be explained by the lag of helping. Column 2 reveals that on top of demographic control variables, specific characteristics of personality traits are good predictors of helping behavior. In particular, in firms with a higher average level of agreeableness, helping behavior also tends to be higher (0.1 SD). On the other hand, a 1 SD greater average level of neuroticism is associated with a 0.1 SD decrease in helping. In contrast, self-efficacy is not significantly related with helping behavior. These results are broadly in line with our hypotheses.

Table 2: Determinants of mutual helping

Dep. variable:	Helping index (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Helping index$_{t-1}$	0.33***	0.29***	0.27***	0.26***	0.22***	0.21***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Conscientiousness		0.06	0.07*	0.06*	0.07*	0.06
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion		0.05	0.03	0.03	0.04	0.04
		(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Neuroticism		-0.10***	-0.08**	-0.06*	-0.01	-0.01
		(0.03)	(0.04)	(0.04)	(0.03)	(0.03)
Openness		0.03	0.01	0.00	0.00	0.00
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Agreeableness		0.09**	0.06	0.05	0.06	0.06

		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Self efficacy		-0.02	-0.05	-0.05	-0.05	-0.05
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Trust			0.15***	0.12***	0.12***	0.12***
			(0.04)	(0.04)	(0.04)	(0.04)
Positive recipr.			0.10***	0.10***	0.13***	0.13***
			(0.03)	(0.03)	(0.04)	(0.04)
Negative recipr.			-0.00	-0.01	0.01	0.01
			(0.04)	(0.04)	(0.05)	(0.05)
Altruism			0.11***	0.10***	0.08**	0.09**
			(0.04)	(0.04)	(0.04)	(0.04)
Risk attitude			0.04	0.04	0.03	0.03
			(0.03)	(0.03)	(0.04)	(0.04)
Time preferences			-0.01	-0.01	0.00	0.00
			(0.04)	(0.04)	(0.04)	(0.04)
Behindness aversion			0.04	0.06*	0.06	0.06*
			(0.03)	(0.03)	(0.04)	(0.04)
Aheadness aversion			-0.03	-0.03	-0.05	-0.05
			(0.04)	(0.04)	(0.04)	(0.04)
Leadership				0.15***	0.16***	0.16***
				(0.03)	(0.04)	(0.04)
ASB_{t-1}						-0.03
						(0.03)
Constant	-1.06**	-0.81*	-0.76*	-0.59	-0.80	-0.75
	(0.43)	(0.41)	(0.41)	(0.41)	(1.32)	(1.32)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM Practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.19	0.22	0.25	0.26	0.26	0.26
Obs.	973	973	973	973	849	849

The dependent variable "Helping index" is an index containing the standardized firm-wave average of two items. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

In column 3, when adding the firm-wave averages of economic preferences, agreeableness becomes insignificant, which is likely mediated by the inclusion of trust, altruism and positive reciprocity into the model. In firms with a 1 SD higher level of trust we see a 0.15 SD increase in the average helping index. This is consistent with research showing that beliefs about others' cooperation is a positive predictor for own (and mutual) cooperation (Gächter et al., 2012; Miettinen et al., 2020).

Positive reciprocity and altruism are strongly associated with helping in firms, with an effect size of 0.1 SD, which is also in line with our hypotheses that more prosocial workers will provide greater

helping behavior on average. Thus, helping others is driven by a social preference unconditional on others' behavior (altruism), as well as a social preference conditional on others' behavior (reciprocity). This evidence is also complementary to evidence outside the workplace, showing that prosocial preferences are associated with various kinds of helping behavior (Falk et al., 2018). Also our results are in line with evidence that negative reciprocity is not correlated with most kinds of helping behavior (Falk et al., 2018). This evidence together supports the stylized fact that in a representative panel of firms, neuroticism, trust and social preferences have a large explanatory power in predicting helping behavior.

We next hypothesize that a supervisor's leadership skill has an impact on helping in firms (Kosfeld, 2020; Hoffman and Tadelis, 2021). We add the standardized leadership quality index (i.e., the three items on a supervisor's level of trust, understanding, and fairness) in column 4 and find that, on average, a 1 SD increase in leadership quality is positively associated with a 0.15 SD increase in helping at the firm level. This shows that leadership quality has significant, additional explanatory power on top of personality traits and individual preferences. Coefficients for individual preferences and neuroticism remain qualitatively similar in terms of significance when adding our leadership index. Hence, preferences and leadership are somewhat complementary in nature when explaining helping behavior, however personality is to some degree substituted by preferences. The point estimates of our significant explanatory variables are similar in size, and we cannot reject in pairwise comparisons that economic preferences have a greater or smaller effect on helping than leadership does at conventional significance levels. Hence, these variables are equally important drivers of helping behavior at the workplace in our representative sample.

Different reasons might explain why leadership quality explains helping behavior even after controlling for personality traits and preferences of employees. Even if an employee is prosocial, she faces uncertainty about the future helping behavior of colleagues, and her supervisor can coordinate helping by managing beliefs in teams, working groups, and across the firm at large. Good leadership can signal the types of others in the firm or the social norm (Sliwka, 2007; Danilov and Sliwka, 2017) and it can convince an employee that helping others is an optimal behavior (Potters, Sefton, and Vesterlund, 2007).

The results are robust to the inclusion of HRM practices and additional job controls, as column (5) shows. None of the management practices are significantly associated with helping behavior. Further, the results remain robust, if we also include our measure of antisocial behavior in $t-1$ (column (6)).

4.5 Antisocial behavior

We now focus on the determinants of antisocial behavior. As above, we start by regressing the firm-wave average of antisocial behavior on the lag of the dependent variable and our set of base controls using firm-level OLS regressions using analytic weights. We then sequentially add personality traits, preferences, leadership, as well as management practices and job controls.

Column 1 of Table 3 shows that antisocial behavior is moderately persistent on the firm level: A 1 SD higher level of antisocial behavior in the previous wave is associated with a 0.27 SD higher level of antisocial behavior in the next wave.

In column 2, when adding the Big 5 personality traits and self-efficacy, the facets neuroticism and agreeableness turn out to be strong predictors of antisocial behavior in firms. In detail, a 1 SD larger firm-wave average of neuroticism is associated with a 0.2 SD higher level of antisocial behavior. One potential explanation could be that in firms with more neurotic types, employees feel as if they are harassed more. Also likely is a larger amount of misunderstandings concerning neurotic employees. Conversely, in firms with a 1 SD higher level of agreeableness, a 0.13 SD lower antisocial behavior is reported. Similar to helping, self-efficacy is not significantly related to antisocial behavior. This is broadly in line with our hypotheses made about personality traits.

In column 3 of Table 3, we add the firm-wave averages of economic preferences and find that trust is the only preference related to antisocial behavior. The coefficient on trust has a negative sign and is quite large in magnitude. A 1 SD increase in firm-level trust is associated with 0.2 SD less antisocial behavior. If colleagues do not trust each other, it is likely they will act in a self-preserving manner. The coefficients belonging to neuroticism and agreeableness remain qualitatively the same.

We observe the by far largest coefficient size for leadership quality, as can be seen in column 4 of Table 3. A 1 SD larger average leadership quality in wave t is associated with a 0.39 SD lower antisocial behavior in a given firm. Furthermore, the adjusted R-squared also increases from 0.21 to 0.34, an explanatory power increase of over 60%. This shows that leadership quality, on top of personality and preferences, is the most important factor in reducing harassment, bullying and other antisocial behaviors that can be thought of as a negative side to corporate culture. It also stresses the importance of good leadership for firms and emphasizes the role of managers in work relationships. The coefficient size for leadership quality is larger here than when explaining mutual help. This is potentially a result of antisocial behavior being less sticky, but also potentially a result of the wording of the outcome variable specifically mentioning superiors as well as colleagues as the source of antisocial behavior, while helping is only focused on colleagues. In contrast to helping behavior, here we find a statistically

significant difference between the coefficients of leadership and trust (Wald test, $p < 0.001$).

All results are robust to including job controls and HRM practices in column 5 of Table 3, with agreeableness losing some statistical power. Again, none of our elicited management practices are consistently associated with antisocial behavior in columns 5 or 6 of Table 3 at conventional levels of statistical significance (except for written target agreements and consequence management, which are weakly significant). Also, results remain robust when we additionally control for our alternative outcome variable, helping in $t-1$.

Table 3: Determinants of antisocial behavior

Dep. variable:	Antisocial behavior (ASB) (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
ASB_{t-1}	0.27***	0.21***	0.18***	0.13***	0.13***	0.13***
	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Conscientiousness		0.07*	0.05	0.06*	0.07*	0.07*
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion		-0.01	0.01	0.00	-0.00	-0.00
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Neuroticism		0.20***	0.16***	0.13***	0.14***	0.14***
		(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
Openness		0.05	0.04	0.07**	0.06*	0.06*
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Agreeableness		-0.13***	-0.09***	-0.06*	-0.05	-0.05
		(0.03)	(0.04)	(0.03)	(0.04)	(0.04)
Self efficacy		-0.02	-0.05	-0.04	-0.05	-0.05
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Trust			-0.20***	-0.12***	-0.10***	-0.10***
			(0.03)	(0.03)	(0.03)	(0.03)
Positive recipr.			-0.04	-0.04	-0.03	-0.03
			(0.04)	(0.03)	(0.03)	(0.03)
Negative recipr.			0.03	0.04	0.04	0.04
			(0.04)	(0.03)	(0.04)	(0.04)
Altruism			-0.01	0.01	0.02	0.02
			(0.04)	(0.04)	(0.04)	(0.04)
Risk attitude			0.04	0.04	0.03	0.03
			(0.03)	(0.03)	(0.03)	(0.03)
Time preferences			0.06	0.05	0.05	0.05
			(0.04)	(0.03)	(0.03)	(0.03)
Behindness aversion			0.01	-0.02	-0.02	-0.02
			(0.04)	(0.04)	(0.04)	(0.04)
Aheadness aversion			0.04	0.03	0.04	0.04
			(0.03)	(0.03)	(0.03)	(0.03)
Leadership				-0.39***	-0.40***	-0.40***
				(0.03)	(0.03)	(0.03)
$Helping_{t-1}$						-0.01
						(0.03)

Constant	0.72*	0.54	0.44	0.04	-0.79	-0.79
	(0.39)	(0.39)	(0.39)	(0.35)	(1.06)	(1.06)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM Practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.12	0.18	0.21	0.34	0.35	0.35
Obs.	973	973	973	973	849	849

The dependent variable is the standardized firm-wave average of antisocial behavior. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

4.6 Robustness tests

We conduct several robustness checks and present the results in Section A.2 of the Appendix. In detail, we control for individual ability, address a potential sample selection bias, we average observations across the whole time period of the survey, exclude sample refreshers to address potential attrition and composition effects and, finally, address a potential attenuation bias of our time-variant explanatory variables by running instrumental variables estimations. In the following, we briefly present the robustness checks separately for our two dependent variables helping and antisocial behavior.

4.6.1 Helping

First, it could be that individual ability is spuriously correlated with both the outcome variable and our independent variables of interest, such as economic preferences (Dohmen et al., 2010). Hence, in Table A.10, we additionally control for an ability proxy, namely the firm-average of AKM individual fixed effects of employees sampled in the LPP (see Section 3.1.1 where we use AKM firm fixed effects instead as proxy for establishment productivity). These individual fixed effects have been widely used as ability proxies for employees (see, e.g., Bender et al. (2018)) and are calculated using the full sample of LIAB data from the IAB for the period 2010-2017, which covers most of our sample period. The fixed effect is imputed across all individual observations (Abowd, Kramarz, and Margolis, 1999; Card, Heining, and Kline, 2013). Table A.10 broadly confirms our baseline results, as the coefficients for trust, positive reciprocity, and leadership are robust across all specifications, when controlling for individual ability.

Next, we use a balanced panel of firms to address a potential selectivity bias. Here, we only keep firms in the data set that have been surveyed in all four waves of the LPP. As Table A.12 shows, the coefficient sizes remain largely unchanged. In a further robustness test, we calculate firm-level averages of all variables over the whole time period, as pooling all observations might remove some idiosyncratic measurement error leading to more precise estimates. Hence, we use one observation per establishment here. Table A.14 again shows similar results compared to our main specification. Next, we exclude sample refreshers from the employee survey from the analysis to check whether our results are driven by attrition and composition effects of the workforce. As Table A.16 shows, the results again are very similar to our baseline specification.

We also address a potential attenuation bias of our time-variant explanatory variables in an additional robustness check. In Table A.18, we show random-effects instrumental variables estimations for average helping and leadership (columns 1-3), and for average helping and management practices (columns 4 and 5). We instrument leadership in t by leadership in $t-1$, as proposed by Hoffman and Tadelis (2021). The first stage shows a precisely estimated correlation (small standard error) and an effect size of 0.37, which constitutes a large effect. Thus, the IV estimates support our baseline results from the lagged dependent variables estimation that leadership is a good predictor of helping behavior.

In Tables A.8 and A.9, we separate the helping index into its two individual survey items used to measure helping behavior, *help given*, and *help received*. The results show that higher agreeableness is associated with more help received, while greater neuroticism is associated with less help given. Trust, altruism and positive reciprocity are associated with both help given and help received. Leadership is associated with both help given and help received, however the association is stronger for help received. Thus, our baseline results using the helping index as dependent variable are broadly confirmed.

Last, in column 1 of Table A.22, we regress the helping index on each item from the leadership index separately. This shows that primarily supervisor fairness and understanding are the main drivers of helping within the leadership index. Further, this is mostly driven by help received, as columns 3 and 4 show.

To conclude, our findings regarding the link between personality traits, trust, social preferences, leadership and helping behavior appear to be robust across a broad range of alternative specifications.

4.6.2 Antisocial behavior

Similarly to the previous subsection, we run the same robustness checks for antisocial behavior and again, our main results are unchanged. First, when we control for the individual ability proxy (AKM

individual fixed effects) in Table A.11, our existing results remain quantitatively robust. Similarly, when using a balanced panel of firms in Table A.13, coefficient sizes and significance levels for neuroticism, trust, and leadership remain largely unchanged. The first lag of the dependent variable has a somewhat larger coefficient size.

Taking firm-level averages of all variables over time in a next robustness test in Table A.15 shows very similar coefficient sizes and significance of neuroticism, agreeableness, trust, and leadership to the main specification. Some coefficients also become larger and increase in significance.

In another robustness check in Table A.17, where we exclude sample refreshers from the analysis, coefficients of neuroticism, agreeableness, trust and leadership are all significant and similar in magnitude.

In an IV analysis analogously to that used for helping behavior, shown in Table A.19 of the Appendix, we find consistent evidence that a higher employee leadership rating is a strong driver of reducing antisocial behavior. The correlation from the IV regression is larger, -0.47 and is precisely estimated, suggesting that measurement error of leadership quality potentially plays a role in the OLS estimation.

Looking at which elements of the leadership index drive the results, we regress antisocial behavior on the individual leadership items in Table A.22 of the Appendix. This shows that each item drives antisocial behavior to some extent, but that supervisor fairness is largest. This is intuitive since antisocial behavior also mentions treatment by the supervisor in the survey item. Nevertheless, supervisor trust also plays a substantial role.

Altogether, the robustness checks support the interpretation that leadership along with personality play and important role in explaining antisocial behavior in the workplace.

4.6.3 Model Selection

We also show which sets of explanatory variables work best together to explain mutual help and antisocial behavior. We do this in a model selection exercise in Table A.20. We use the same lagged specification to Section 4, first including base controls in Model 1, and then in the other models including each possible combination of personality, preferences, leadership, and management practices. We report the Akaike information criterion (AIC), the Bayes-Schwarz information criterion (BIC), and the adjusted R^2, as model selection criteria. We also report F-test statistics of the entire model, and of each variable set.

The AIC suggests that including only the leadership index (Model 4) carries the best predictive power of the helping index, while the BIC points towards Model 12 with leadership, personality, and preferences. The F-tests for personality and preferences on top of leadership are 2.11 and 3.79 respectively, suggesting they do convey additional information. The adjusted-R^2 is largest when including personality and preferences, as well as leadership. This suggests that personality, preferences, and leadership, are best *together* at explaining our observed data on mutual helping using regressions. Management practices are in no model useful predictors according to these results.

We repeat the exercise for antisocial behavior as the outcome. Here we also find that leadership performs well in all specifications. The AIC value is lowest for the model with all sets of independent variables included, and the BIC is lowest for the model only using personality and leadership, in line with the main results. The change in adjusted R^2 from just controls to a single set of independent variables is largest when including leadership, too. Here it appears that personality and preferences are complements in explaining antisocial behavior, as the adjusted R^2 is generally larger with both sets of variables together than using each variable set on its own, and the F-tests show significant values for both variables across all specifications.

5 Conclusion

This paper uses a unique linked employer-employee data set to document the heterogeneity and the determinants of firm-level measures of helping and antisocial behavior at the workplace. Our data are representative of a large, developed economy and cover a substantial period. The surveys apply experimentally validated items to measure economic preferences, and they use other established measures from validated scales to measure trust, personality traits, and leadership quality. Finally, the data provides rich information on further employee and firm characteristics, including human resource management practices. As far as we know, we are the first to combine such rich and complementary employer-employee data to uncover the economic and behavioral foundations of helping and antisocial behavior at the workplace.

Our results document considerable variation in helping and antisocial behavior across firms. Although these behaviors are negatively correlated, many firms exhibit both high levels of helping and antisocial behavior, suggesting that these are distinct constructs. Further, we find that helping and antisocial behavior are associated with firm productivity, employee job satisfaction, turnover, and other relevant firm outcomes. Moreover, altruism, positive reciprocity, and trust are most important for

explaining prosocial behavior in a workplace context across a representative sample of firms. Negative reciprocity does not play a substantial role here. Employees' personality traits also matter, especially neuroticism for antisocial behavior. In addition, good leadership adds significant explanatory power and is strongly associated with more helping and in particular less antisocial behavior.

Summarizing, we provide the first representative evidence that personality traits, preferences, trust, and leadership quality are essential explanations for the observed differences in helping and antisocial behavior across firms. Although our findings are correlative, they corroborate lab evidence that helping and antisocial behavior matter, and provide additional external validity to a growing body of evidence on the importance of preferences, personality, and leadership in a broad range of settings. Our data suggest that increasing helping behavior and reducing antisocial behavior allows firms to be more productive and satisfying work environments. Our findings further indicate that selecting the right employees is vital for promoting helping and curbing antisocial behavior in organizations. However, good leadership also appears to have a substantial additional effect on workplace behavior. Employee selection is not everything; even if a firm can get the right workers together, a leader can substantially affect these behaviors on top of personality and preferences.

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A.1 Descriptive statistics

Table A.1: Survey items of individual-level variables

Survey item (or index)	Panel question	Exact wording of item(s)	Scale
Helping index	Yes	A: "How often do you receive support or help from your colleagues if you ask?" B: "How often do you offer your colleagues help?"	Index (5-point scale)
Antisocial behavior	Yes	"How often do you feel wrongly criticized, harassed or denounced by your colleagues or superiors?"	5-point
Positive reciprocity	No	"If someone does me a favor, I am prepared to return it."	5-point
Negative reciprocity	No	"If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so."	5-point
Altruism	No	"How do you assess your willingness to share with others without expecting anything in return?"	11-point
Trust	No	A: "Nowadays, one can't rely on anybody." B: "On the whole, one can trust people."	5-point
Behindness aversion	No	"It makes me angry when others are undeservingly better off than me."	5-point
Aheadness aversion	No	"I feel guilty when I am better off than others for no reason."	5-point
Risk attitude	No	"How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?"	11-point
Time preference	No	"A: I abstain from certain things today so I can afford more tomorrow." "B: I tend to procrastinate things even though it would be better to do them now."	5-point
Big 5: Openness to experience	No	"I see myself as someone who..." D: "is original, comes up with new ideas." I: "values artistic, aesthetic experiences." "N: has an active imagination." P: "is eager for knowledge."	5-point
Big 5: Extroversion	No	"I see myself as someone who..." B: "is communicative, talkative." L: "is reserved." H: "is outgoing, sociable:"	5-point
Big 5: Conscientiousness	No	"I see myself as someone who..." A: "does a thorough job." G: "tends to be lazy." K: "does things effectively and efficiently."	5-point
Big 5: Agreeableness	No	"I see myself as someone who..." C: "is sometimes somewhat rude to others." "F: has a forgiving nature." M: "is considerate and kind to others."	5-point
Big 5: Neuroticism	No	"I see myself as someone who..." E: "worries a lot." J: "gets nervous easily" O: "is relaxed, handles stress well"	5-point
Self-efficacy	No	A: "I can rely on my own abilities in difficult situations." B: "I am able to solve most problems on my own." C: "I can usually solve even challenging and complex tasks well."	5-point

Leadership index	Yes	A: "Supervisors show that they trust in those they manage." B: "Supervisors show an understanding of the people who work for them." C: "The way my supervisor treats me is fair."	5-point
Job satisfaction	Yes	"How satisfied are you with your job?"	11-point
Work engagement	Yes	A: "At my work, I feel bursting with energy." B: "At my job, I feel strong and vigorous." C: "When I get up in the morning, I feel like going to work." D: "I am enthusiastic about my job." E: "My job inspires me." F: "I am proud on the work that I do." G: "I feel happy when I am working intensely." H: I am immersed in my work." I: "I get carried away when I'm working."	5-point
Affective commitment	Yes	A: "I would be very happy to spend the rest of my career with this organization." B: "This organization has a great deal of personal meaning for me." C: "I really feel as if this organization's problems are my own." D: "I do not feel a strong sense of "belonging" to my organization. (R)" E: "I do not feel "emotionally attached" to this organization. (R)" F: "I do not feel like "part of the family" at my organization. (R)"	5-point
Turnover intention	Yes	"How many times in the past 12 months have you thought about changing your job?"	5-point
Sick days	Yes	"How many days did you not work during the previous 12 months because you were ill? Please indicate all sick days, not only those for which you have received a doctor's certificate of incapacity to work."	Range from 1-230 days

Table A.2: Survey items of establishment-level variables

Survey item	Repeatedly asked	Exact wording	Scale
Feedback talk	Yes	"Are structured employee feedback talks conducted at least once a year in your establishment?"	Yes/No
Performance appraisal	Yes	"Does your establishment evaluate the performance of employees at least once a year by their respective supervisors?"	Yes/No
Written target agreement	Yes	Does your establishment use written target agreements?	Yes/No
Consequence management	Yes	"How do you and your managers deal with employees whose performance you are not satisfied with? A: Supervisors openly discuss the problems with the employee concerned. B: HR development measures are offered in a targeted manner to address performance problems. C: If performance problems persist, the company looks for another position in the firm. D: Employees who consistently perform poorly are dismissed or encouraged to leave the company."	Index (5-point Likert scale)
Development plan	Yes	"Does your establishment use (career) development plans for employees?"	Yes/No
Employee survey	Yes	"Are employee surveys conducted regularly in your establishment?"	Yes/No
Working atmosphere	Yes	"In your opinion, how important is the following aspect for retaining your employees in your company: General working atmosphere"	5-point Likert scale
Code of conduct	Yes	"Does your establishment have a written strategy for promoting diversity and equal opportunities in the workforce with regard to characteristics such as gender, age, nationality, culture, religion or sexual orientation?"	Yes/No
Share non-manag. PP	Yes	"What percentage of non-managerial employees receive a variable compensation?"	Percent
Bonus to base	Yes	"How large is the average variable pay component measured as a percentage of the fixed base salary when targets have been met? Please distinguish between managerial and non-managerial employees."	Percent
Pay mix	Yes	"What percentage of the variable compensation of the two employee groups (managerial and non-managerial) is, on average, based on the criteria company-wide performance, team/divisional performance, and individual performance?"	Percent (adding up to 100%)

Table A.3: Summary Statistics

	Obs.	Mean	S.D.	Min.	Max.	Med.
Number of employees	973	36.7	89.8	3.0	446.0	13.0
Helping index	973	4.2	0.3	2.2	5.0	4.2
Help offered	973	4.2	0.3	2.5	5.0	4.2
Help received	973	4.2	0.3	1.3	5.0	4.3
Antisocial behavior	973	1.7	0.3	1.0	3.7	1.6
Engagement	973	3.6	0.3	2.2	4.7	3.6
Commitment	973	3.7	0.4	1.9	4.9	3.7
Job satisfaction	973	7.4	0.7	2.7	10.0	7.5
Turnover intention	973	1.6	0.4	1.0	5.0	1.5
Sick days	973	12.6	9.0	0.0	86.3	10.1
AKM firm $FE_{2010-2017}$	973	0.4	0.2	-0.2	0.7	0.5
Trust	973	3.5	0.3	2.0	4.5	3.5
Positive reciprocity	973	4.5	0.2	2.0	5.0	4.5
Negative reciprocity	973	1.9	0.4	1.0	5.0	1.9
Altruism	973	7.6	0.5	5.3	9.7	7.7
Behindness aversion	973	2.6	0.4	1.0	4.7	2.6
Aheadness aversion	973	2.3	0.4	1.0	4.0	2.3
Risk tolerance	973	5.6	0.6	2.7	8.5	5.6
Time preferences	973	3.5	0.4	1.3	5.0	3.5
Conscientiousness	973	4.4	0.2	3.4	5.0	4.3
Extroversion	973	3.6	0.3	2.6	4.9	3.7
Neuroticism	973	2.7	0.3	1.5	4.0	2.7
Openness	973	3.6	0.2	2.3	4.7	3.6
Agreeableness	973	4.0	0.2	2.9	5.0	4.0
Self efficacy	973	4.2	0.2	3.5	5.0	4.2
Leadership	973	3.8	0.3	1.9	5.0	3.8
Supervisor trust	973	3.8	0.4	1.5	5.0	3.8
Supervisor understanding	973	3.7	0.4	1.7	5.0	3.8
Supervisor fairness	973	3.9	0.4	1.3	5.0	3.9
Feedback talk	973	0.8	0.4	0.0	1.0	1.0
Development plan	973	0.6	0.5	0.0	1.0	1.0
Performance appraisal	972	0.7	0.4	0.0	1.0	1.0
Employee survey	971	0.6	0.5	0.0	1.0	1.0
Code of conduct	972	0.3	0.5	0.0	1.0	0.0
Low performer	969	3.6	0.7	1.3	5.0	3.5
Target agreement	858	0.9	0.4	0.0	1.0	1.0
Work climate important	971	4.3	0.7	1.0	5.0	4.0
Ind. PP empl.	973	0.4	0.5	0.0	1.0	0.0
Team PP empl.	973	0.2	0.4	0.0	1.0	0.0
Firm PP empl.	973	0.4	0.5	0.0	1.0	0.0
Ind. PP man.	973	0.5	0.5	0.0	1.0	0.0
Team PP man.	973	0.3	0.5	0.0	1.0	0.0
Firm PP man.	973	0.6	0.5	0.0	1.0	1.0
Share staff PP	973	35.6	43.1	0.0	100.0	10.0
Depend on me	973	3.7	0.5	1.0	5.0	3.7
Depend on others	973	3.3	0.5	1.0	5.0	3.4
White-collar	973	0.6	0.3	0.0	1.0	0.7
Management position	973	0.3	0.2	0.0	1.0	0.3

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Table A.3 – *Continued from previous page*

	Obs.	Mean	S.D.	Min.	Max.	Med.
Part-time	973	0.1	0.2	0.0	1.0	0.1
Log monthly net wage	973	7.7	0.3	5.3	9.9	7.8
Fixed-term work contract	973	0.0	0.1	0.0	0.9	0.0
Female	973	0.3	0.2	0.0	1.0	0.2
Under 30 years	973	0.1	0.1	0.0	0.7	0.1
30-40 years old	973	0.2	0.1	0.0	0.8	0.1
40-50 years old	973	0.3	0.1	0.0	1.0	0.3
Partner	973	0.8	0.1	0.0	1.0	0.9
Lives alone	973	0.1	0.1	0.0	1.0	0.1
No school certificate	973	0.0	0.0	0.0	0.3	0.0
9th grade	973	0.2	0.2	0.0	1.0	0.2
10th grade	973	0.4	0.2	0.0	1.0	0.4
Univ. of A.sc. ent.	973	0.1	0.1	0.0	1.0	0.1
University entrance qual.	973	0.2	0.2	0.0	1.0	0.2
Other school education	973	0.0	0.0	0.0	1.0	0.0
No further education	973	0.0	0.1	0.0	1.0	0.0
Apprenticeship	973	0.4	0.2	0.0	1.0	0.4
Trade school	973	0.1	0.1	0.0	1.0	0.1
Master craftsman	973	0.2	0.2	0.0	1.0	0.2
Univ. of appl. sciences	973	0.1	0.1	0.0	1.0	0.1
University	973	0.1	0.1	0.0	1.0	0.1
Other further education	973	0.0	0.0	0.0	0.3	0.0
North	973	0.1	0.4	0.0	1.0	0.0
East	973	0.2	0.4	0.0	1.0	0.0
South	973	0.3	0.5	0.0	1.0	0.0
West	973	0.3	0.5	0.0	1.0	0.0
Under 50	973	0.0	0.1	0.0	1.0	0.0
50-99	973	0.1	0.3	0.0	1.0	0.0
100-249	973	0.2	0.4	0.0	1.0	0.0
250-499	973	0.2	0.4	0.0	1.0	0.0
Above 500	973	0.5	0.5	0.0	1.0	0.0
Manufact.	973	0.3	0.5	0.0	1.0	0.0
Metal	973	0.4	0.5	0.0	1.0	0.0
Commerce	973	0.1	0.3	0.0	1.0	0.0
Bus./fin. serv.	973	0.1	0.3	0.0	1.0	0.0
IT/oth. serv.	973	0.0	0.2	0.0	1.0	0.0
Health/Social	973	0.0	0.2	0.0	1.0	0.0
Family owned	973	0.4	0.5	0.0	1.0	0.0
Management-owned	973	0.1	0.4	0.0	1.0	0.0
Financial inv./Dispersed ownership	973	0.2	0.4	0.0	1.0	0.0
State-owned	973	0.0	0.2	0.0	1.0	0.0
Other ownership type	973	0.2	0.4	0.0	1.0	0.0
CATI	973	0.9	0.3	0.0	1.0	1.0
Wave 1	973	0.0	0.0	0.0	0.0	0.0
Wave 2	973	0.5	0.5	0.0	1.0	0.0
Wave 3	973	0.3	0.5	0.0	1.0	0.0
Wave 4	973	0.2	0.4	0.0	1.0	0.0

Table A.4: Contingency table of helping index and ASB

	ASB≤median	ASB>median	Total
Helping≤median	200	287	487
	(41%)	(59%)	(100%)
Helping>median	288	200	486
	(59%)	(41%)	(100%)
Total	488	485	973

The table shows a two-way contingency table of above and below median helping index and antisocial behavior at the firm level. Survey items are shown in Table A.1. The top number in each cell is the frequency and the bottom number is the row percentage. Source: Linked Personnel Panel, waves 2 to 4. One observation of the helping (ASB) index is the firm-wave average. N=973 observations.

Table A.5: Summary statistics of outcome variables by industry

Average mutual helping				
Sector	N	Mean	Med.	S.D.
Manufact.	671	4.25	4.28	0.28
Metal	661	4.24	4.25	0.25
Commerce	267	4.19	4.25	0.37
Bus./fin. serv.	265	4.23	4.29	0.32
IT/oth. serv.	77	4.25	4.29	0.31
Health/Social	81	4.22	4.25	0.28
Total	2,022	4.24	4.25	0.28
Average antisocial behavior				
Sector	N	Mean	Med.	S.D.
Manufact.	671	1.68	1.63	0.33
Metal	661	1.67	1.67	0.28
Commerce	267	1.69	1.67	0.36
Bus./fin. serv.	265	1.59	1.52	0.32
IT/oth. serv.	77	1.60	1.55	0.32
Health/Social	81	1.72	1.70	0.33
Total	2,022	1.66	1.64	0.31
CV mutual helping				

Sector	N	Mean	Med.	S.D.
Manufact.	670	0.15	0.14	0.06
Metal	661	0.16	0.16	0.05
Commerce	267	0.18	0.16	0.08
Bus./fin. serv.	265	0.17	0.15	0.08
IT/oth. serv.	76	0.15	0.14	0.07
Health/Social	80	0.15	0.14	0.06
Total	2,019	0.16	0.15	0.06
CV antisocial behavior				
Sector	N	Mean	Med.	S.D.
Manufact.	670	0.46	0.47	0.13
Metal	661	0.48	0.50	0.11
Commerce	267	0.50	0.51	0.15
Bus./fin. serv.	265	0.46	0.47	0.15
IT/oth. serv.	77	0.46	0.43	0.11
Health/Social	80	0.45	0.47	0.13
Total	2,020	0.47	0.48	0.13

Analytically weighted summary statistics of firm-wave average mutual helping index, antisocial behavior, and firm-wave level coefficients of variation of mutual helping index and antisocial behavior, across sectors. Source: Linked Personnel Panel, waves 1 to 4. Survey items shown in Table A.1. Weights used are number of observations in each establishment-wave cell, which give rise to one observation.

Table A.6: Weighted average of outcome variables by sector and survey wave

Average mutual helping				
Sector	Wave 1	Wave 2	Wave 3	Wave 4
Manufact.	4.30	4.24	4.25	4.13
Metal	4.34	4.26	4.26	4.09
Commerce	4.31	4.13	4.18	3.97
Bus./fin. serv.	4.27	4.22	4.27	4.10
IT/oth. serv.	4.35	4.28	4.22	4.11
Health/Social	4.30	4.20	4.24	4.02

Total	4.31	4.23	4.25	4.10

Average antisocial behavior

Sector	Wave 1	Wave 2	Wave 3	Wave 4
Manufact.	1.69	1.66	1.65	1.73
Metal	1.64	1.67	1.65	1.75
Commerce	1.69	1.72	1.59	1.75
Bus./fin. serv.	1.63	1.57	1.47	1.67
IT/oth. serv.	1.52	1.67	1.57	1.63
Health/Social	1.74	1.61	1.86	1.68
Total	1.66	1.66	1.63	1.73

CV mutual helping

Sector	Wave 1	Wave 2	Wave 3	Wave 4
Manufact.	0.15	0.16	0.15	0.16
Metal	0.15	0.16	0.16	0.18
Commerce	0.16	0.20	0.17	0.20
Bus./fin. serv.	0.16	0.17	0.16	0.18
IT/oth. serv.	0.16	0.14	0.13	0.18
Health/Social	0.15	0.16	0.14	0.17
Total	0.15	0.16	0.16	0.17

CV antisocial behavior

Sector	Wave 1	Wave 2	Wave 3	Wave 4
Manufact.	0.45	0.46	0.45	0.45
Metal	0.48	0.48	0.48	0.49
Commerce	0.51	0.51	0.47	0.49
Bus./fin. serv.	0.48	0.47	0.44	0.44
IT/oth. serv.	0.45	0.45	0.45	0.51
Health/Social	0.44	0.47	0.47	0.42
Total	0.47	0.47	0.46	0.48

Analytically weighted averages of firm-wave average mutual helping index, antisocial behavior, and firm-wave level coefficients of variation of mutual helping index and antisocial behavior, across industry classifications and their development over time. Source: Linked Personnel Panel, waves 1 to 4. Survey items shown in Table A.1. Weights used are number of observations in each establishment-wave cell, which give rise to one observation. Number of firm-wave cells is $N = 2,019 - 2,022$ per survey item, .

Table A.7: Correlation matrix

Variables	Help	ASB	Lead.	Trust	Pos r.	Neg r.	Alt.	Risk	Time	Beh.	Ahea.	Consc.	Extr.	Neur.	Open.	Agre.	SE
Helping	1.000																
ASB	-0.228	1.000															
	(0.000)																
Leadership.	0.249	-0.502	1.000														
	(0.000)	(0.000)															
Trust	0.216	-0.270	0.284	1.000													
	(0.000)	(0.000)	(0.000)														
Positive recipr.	0.125	-0.012	0.030	-0.056	1.000												
	(0.000)	(0.701)	(0.355)	(0.082)													
Negative recipr.	-0.091	0.092	-0.073	-0.194	-0.006	1.000											
	(0.005)	(0.004)	(0.022)	(0.000)	(0.854)												
Altruism	0.144	-0.024	0.056	0.106	0.133	-0.213	1.000										
	(0.000)	(0.451)	(0.079)	(0.001)	(0.000)	(0.000)											
Risk attitude	0.068	0.041	0.003	-0.042	-0.021	0.028	0.054	1.000									
	(0.033)	(0.200)	(0.932)	(0.193)	(0.507)	(0.375)	(0.094)										
Time preferences	-0.059	0.110	-0.085	-0.166	0.076	0.051	0.037	0.001	1.000								
	(0.065)	(0.001)	(0.008)	(0.000)	(0.018)	(0.115)	(0.249)	(0.978)									
Behindness aversion	-0.060	0.183	-0.206	-0.302	0.043	0.165	-0.239	-0.025	0.150	1.000							
	(0.061)	(0.000)	(0.000)	(0.000)	(0.181)	(0.000)	(0.000)	(0.427)	(0.000)								
Aheadness aversion	-0.045	0.111	-0.078	-0.033	0.048	0.090	0.052	-0.094	0.072	0.376	1.000						
	(0.162)	(0.001)	(0.015)	(0.306)	(0.136)	(0.005)	(0.103)	(0.003)	(0.026)	(0.000)							
Conscientiousness	0.047	0.013	0.024	-0.145	0.209	-0.175	0.101	0.032	0.183	0.066	-0.114	1.000					
	(0.147)	(0.691)	(0.452)	(0.000)	(0.000)	(0.000)	(0.002)	(0.320)	(0.000)	(0.040)	(0.000)						
Extroversion	0.125	-0.057	0.092	0.030	0.186	-0.118	0.143	0.124	-0.027	-0.039	-0.068	0.260	1.000				
	(0.000)	(0.077)	(0.004)	(0.358)	(0.000)	(0.000)	(0.000)	(0.000)	(0.396)	(0.219)	(0.035)	(0.000)					
Neuroticism	-0.185	0.256	-0.209	-0.200	0.016	0.062	-0.055	-0.131	0.122	0.249	0.251	-0.013	-0.193	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.608)	(0.055)	(0.086)	(0.000)	(0.000)	(0.000)	(0.000)	(0.684)	(0.000)				
Openness	0.089	0.043	0.070	0.039	0.128	-0.054	0.167	0.210	0.045	0.038	0.100	0.159	0.275	0.009	1.000		
	(0.005)	(0.178)	(0.029)	(0.226)	(0.000)	(0.093)	(0.000)	(0.000)	(0.159)	(0.234)	(0.002)	(0.000)	(0.000)	(0.776)			
Agreeableness	0.111	-0.145	0.142	0.163	0.094	-0.333	0.220	-0.060	0.055	-0.161	-0.033	0.315	0.144	-0.142	0.131	1.000	
	(0.001)	(0.000)	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)	(0.062)	(0.085)	(0.000)	(0.305)	(0.000)	(0.000)	(0.000)	(0.000)		
Self efficacy	0.027	-0.014	0.013	-0.122	0.308	0.036	0.149	0.209	0.135	0.006	-0.111	0.382	0.259	-0.178	0.231	0.129	1.000
	(0.394)	(0.664)	(0.684)	(0.000)	(0.000)	(0.258)	(0.000)	(0.000)	(0.000)	(0.843)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

A.1.1 Histograms

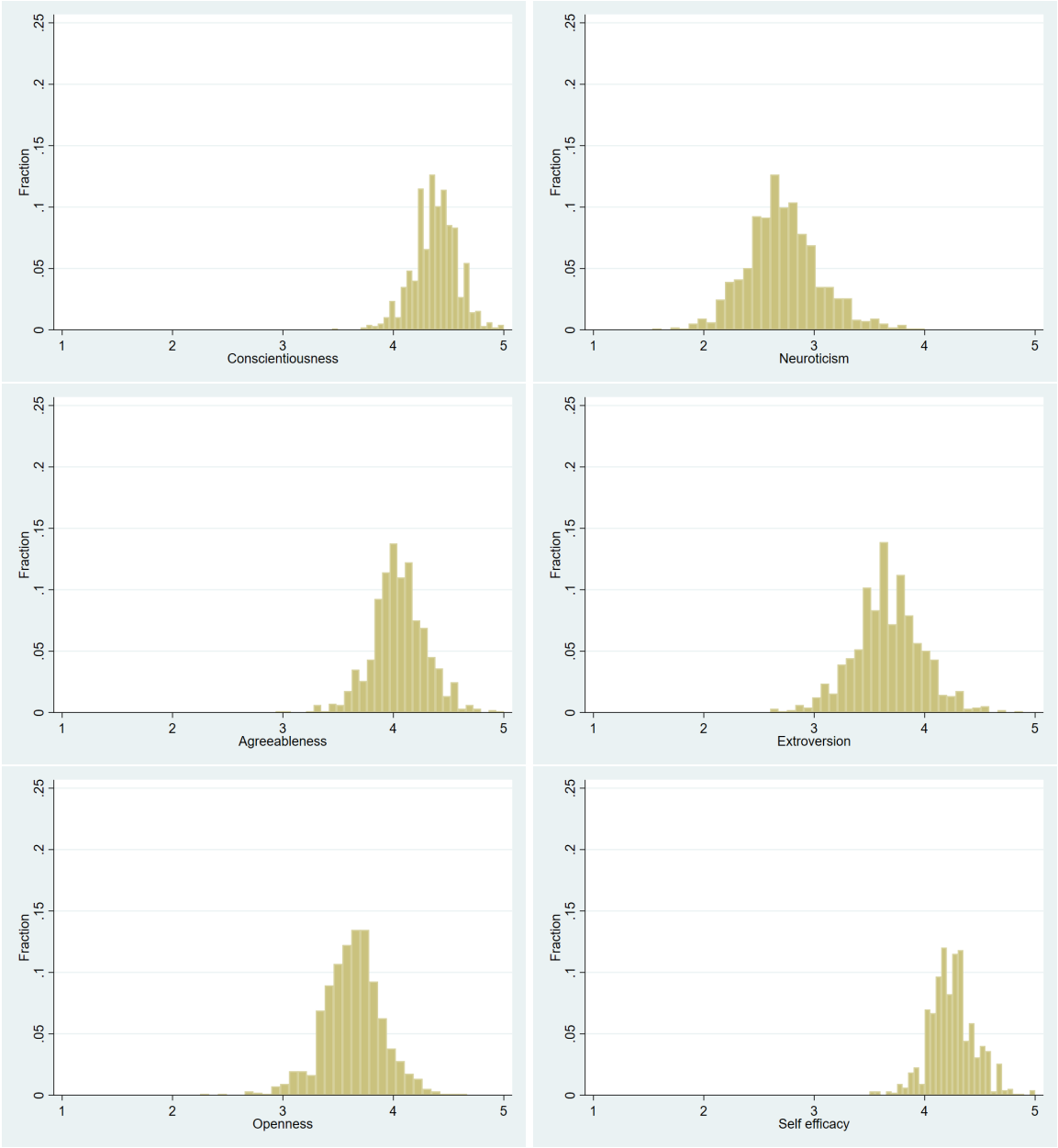


Figure A.1: Distribution of Big 5 personality traits, and self efficacy. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

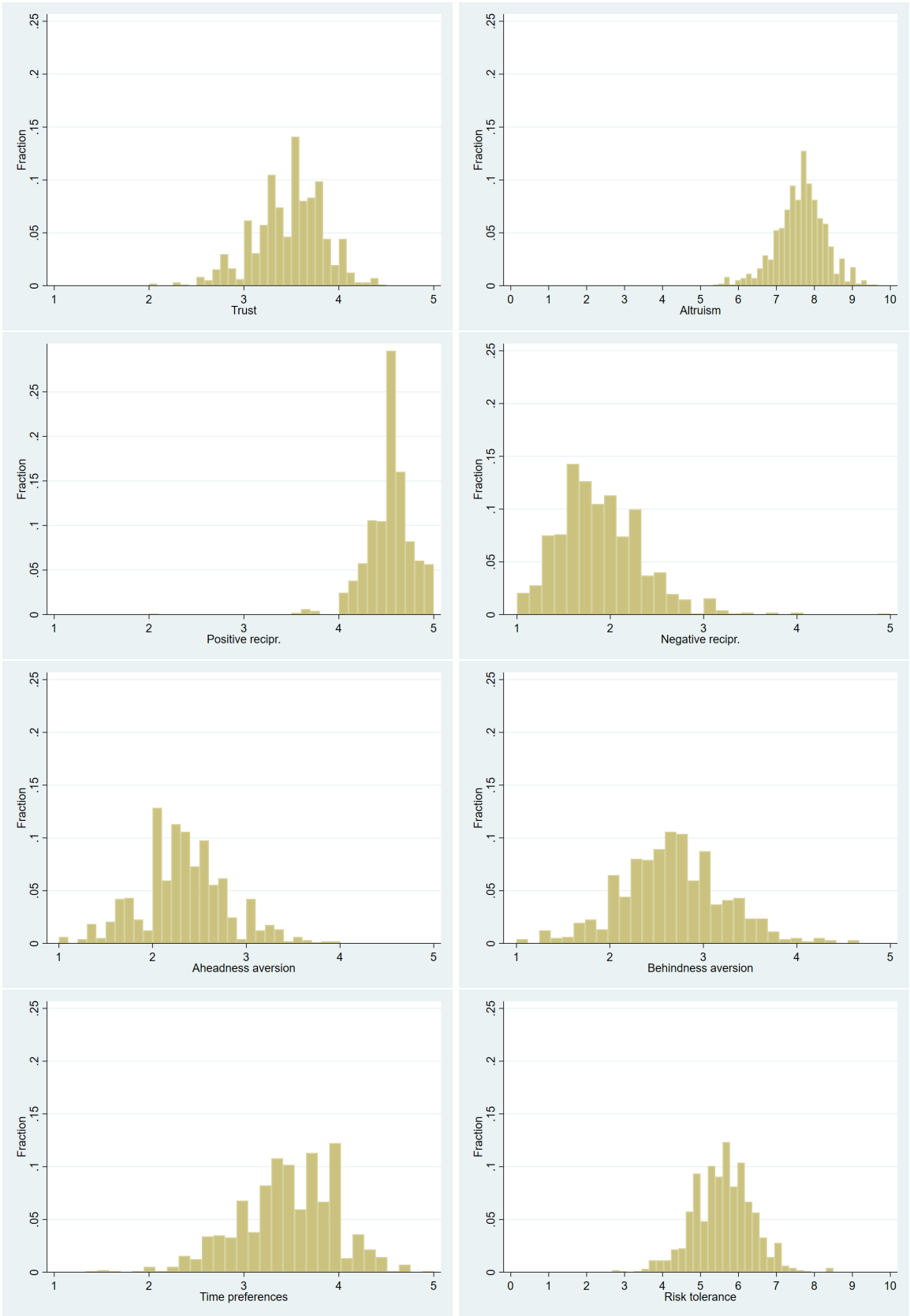


Figure A.2: Firm-wave level averages of preferences in waves 2 to 4. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

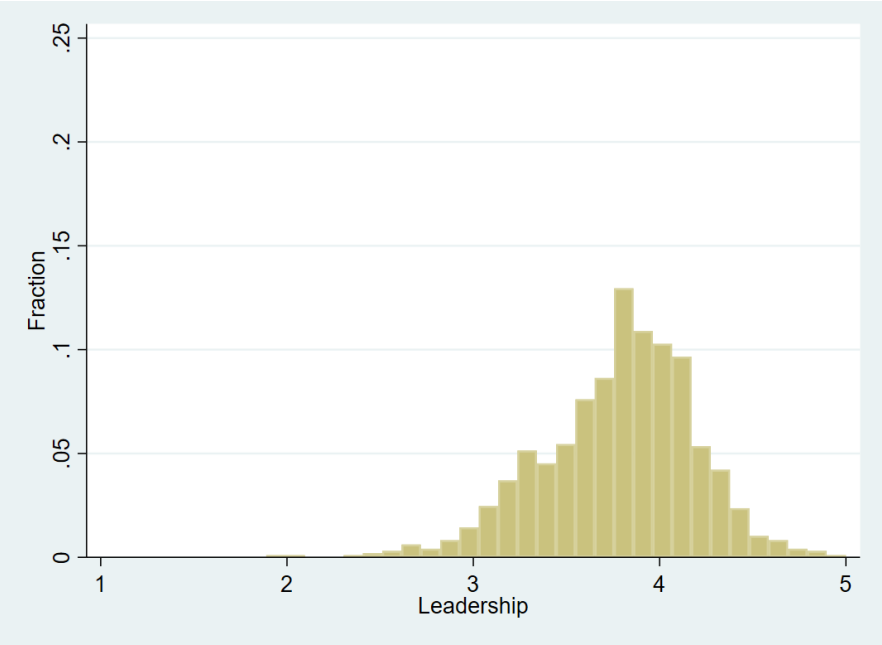


Figure A.3: Distribution of establishment-level averages of the leadership index. The leadership index is the equally weighted average of three items, supervisor trust, supervisor understanding and supervisor fairness. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

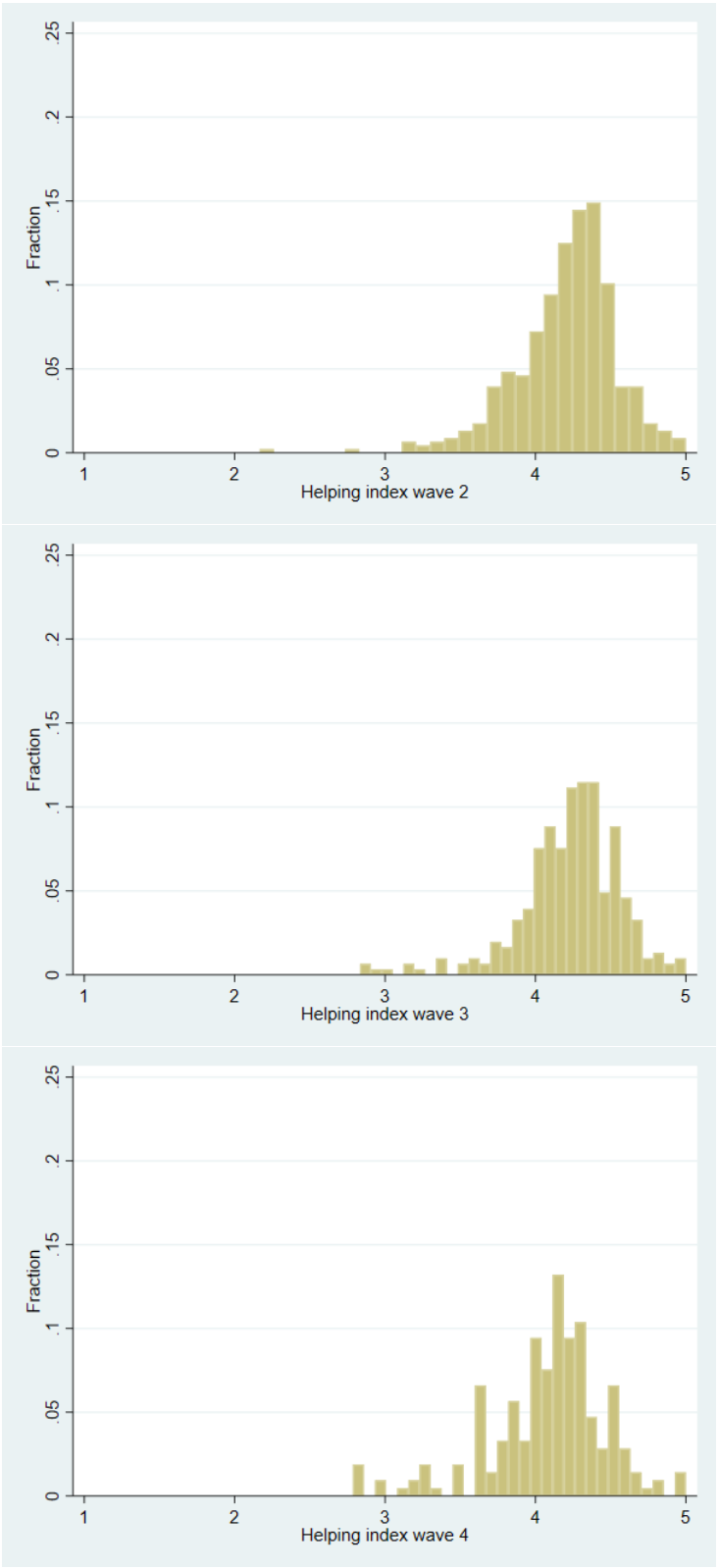


Figure A.4: Distribution of the establishment-wave average helping index by wave. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. Wave 2: N=456, wave 3: N=305, wave 4: N=210. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

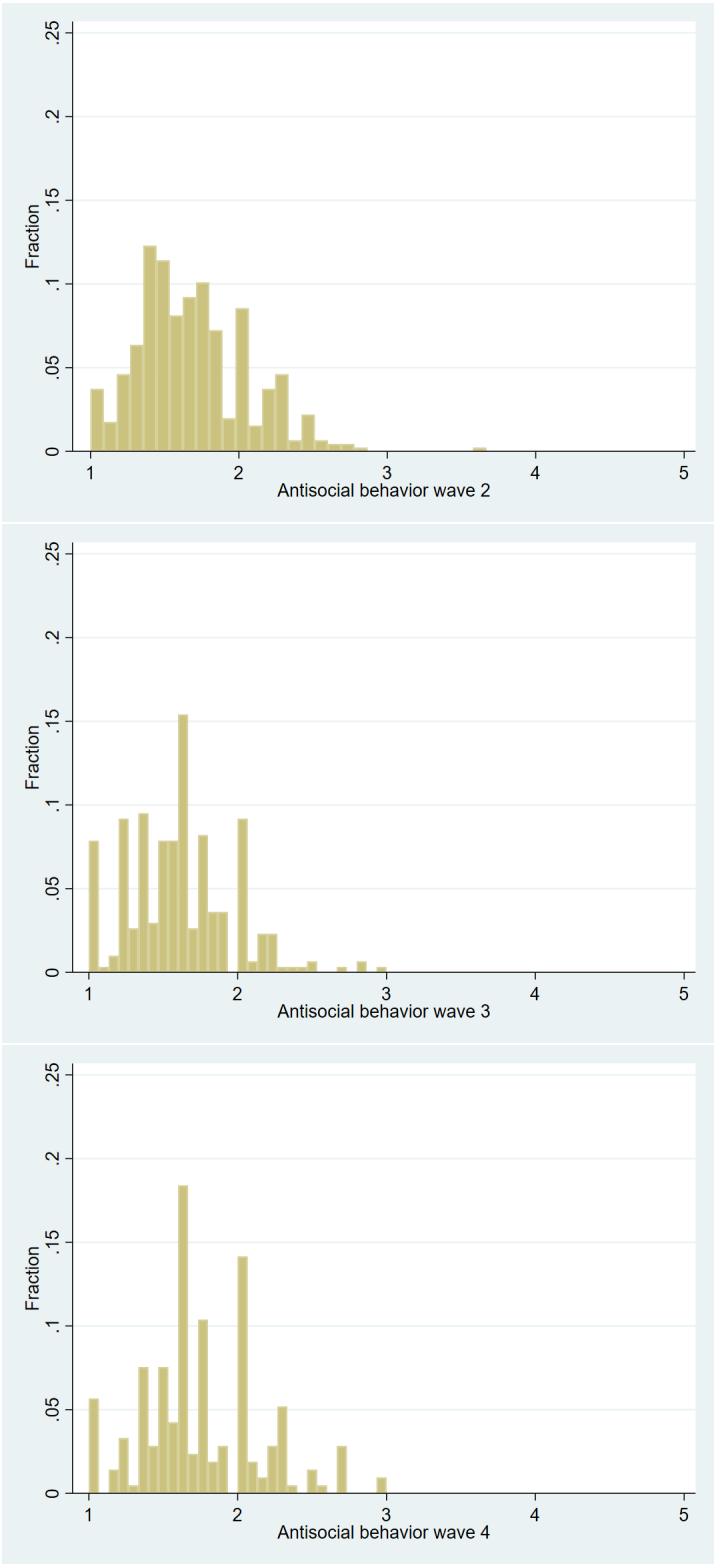


Figure A.5: Distribution of antisocial behavior of establishments by wave. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

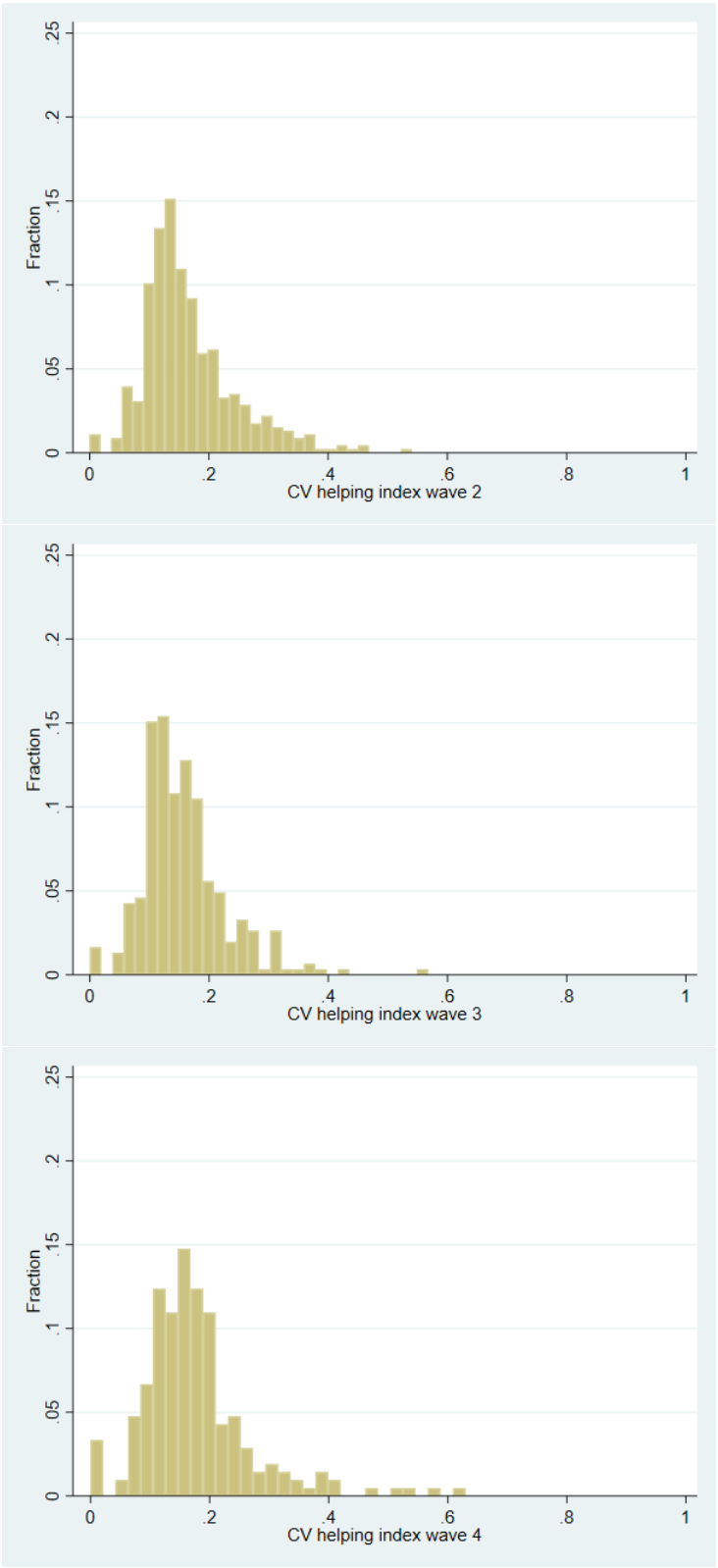


Figure A.6: Distribution of coefficients of Variation of helping index of establishments by wave. Source: Linked Personnel Panel, waves 2 to 4. Only establishments with at least 3 employee respondents per wave used. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

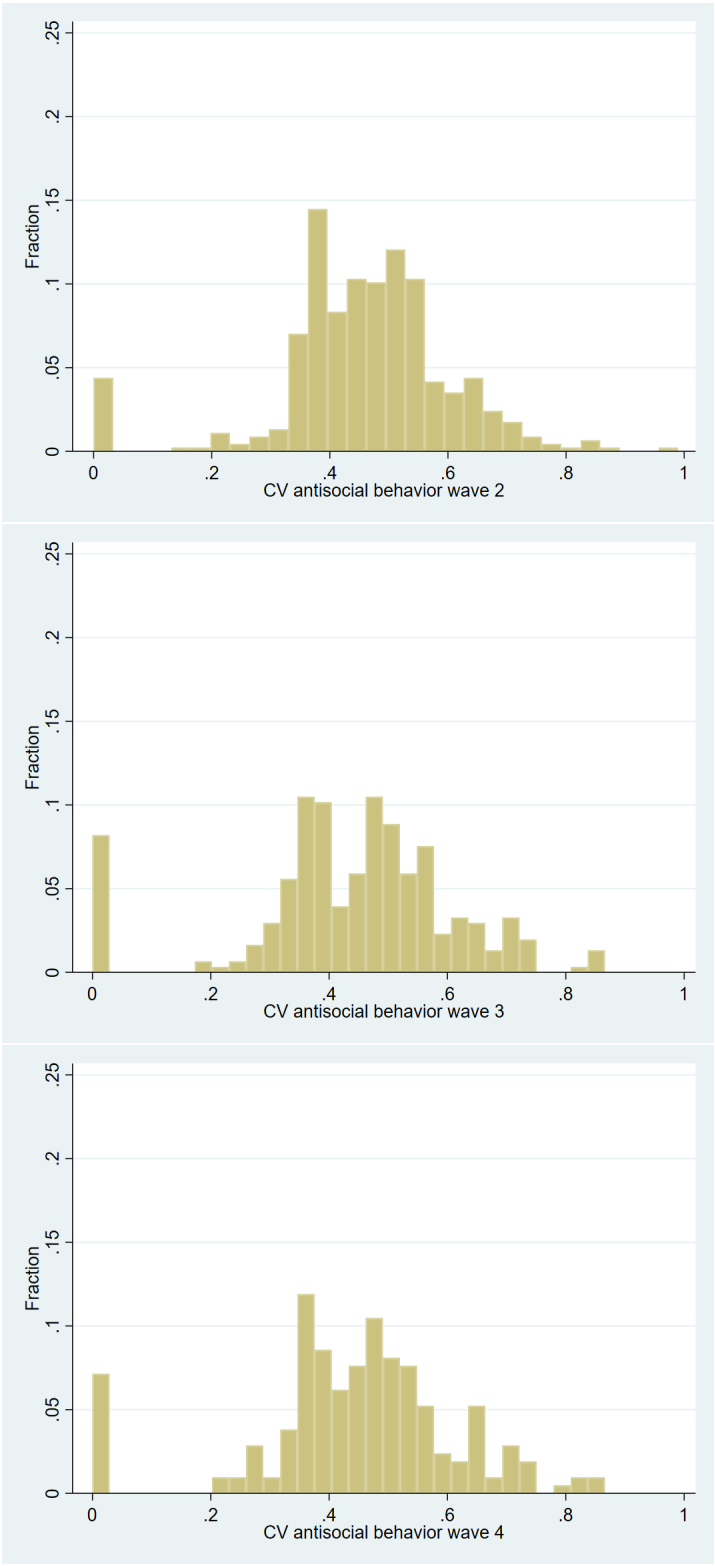


Figure A.7: Distribution of coefficients of variation of antisocial behavior in each establishment by wave. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

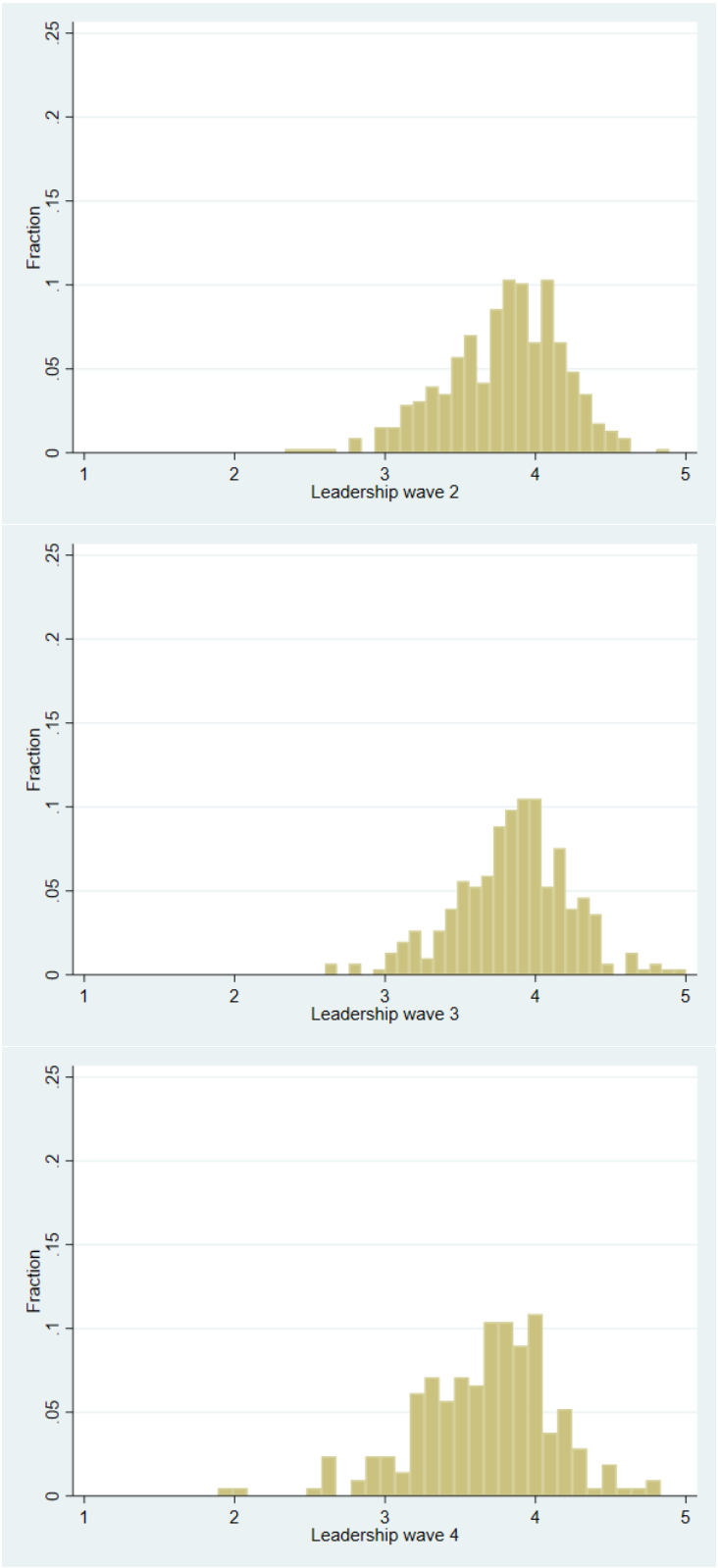


Figure A.8: Distribution of the leadership index by wave. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

A.1.2 Binned scatter plots

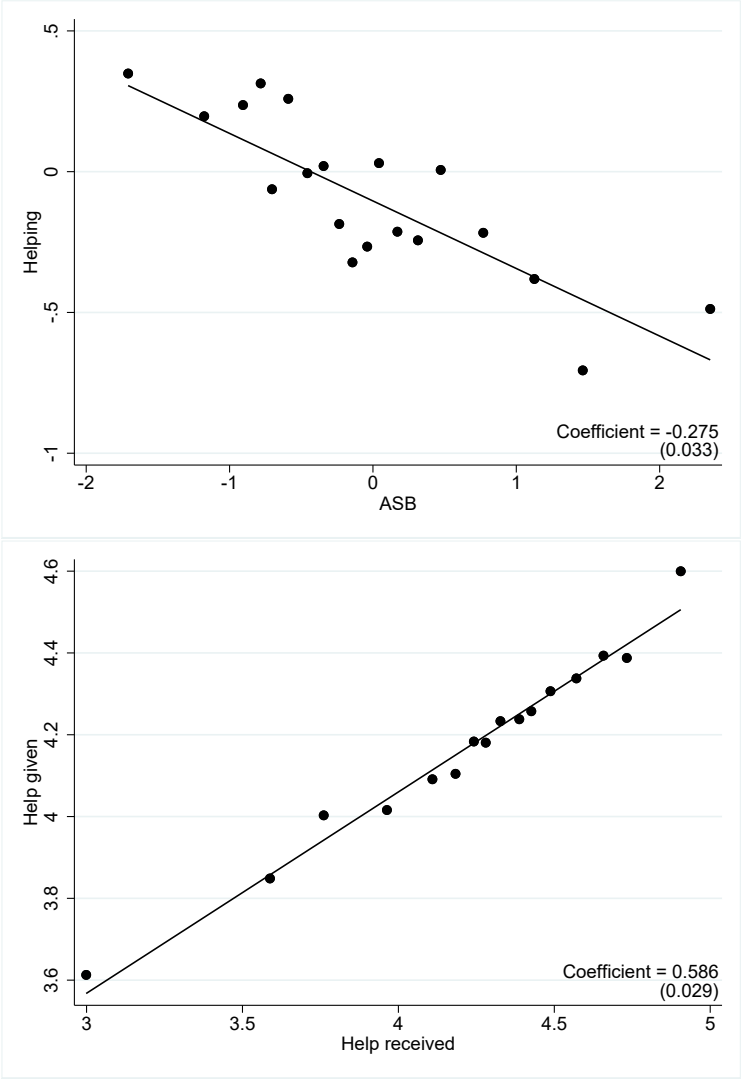
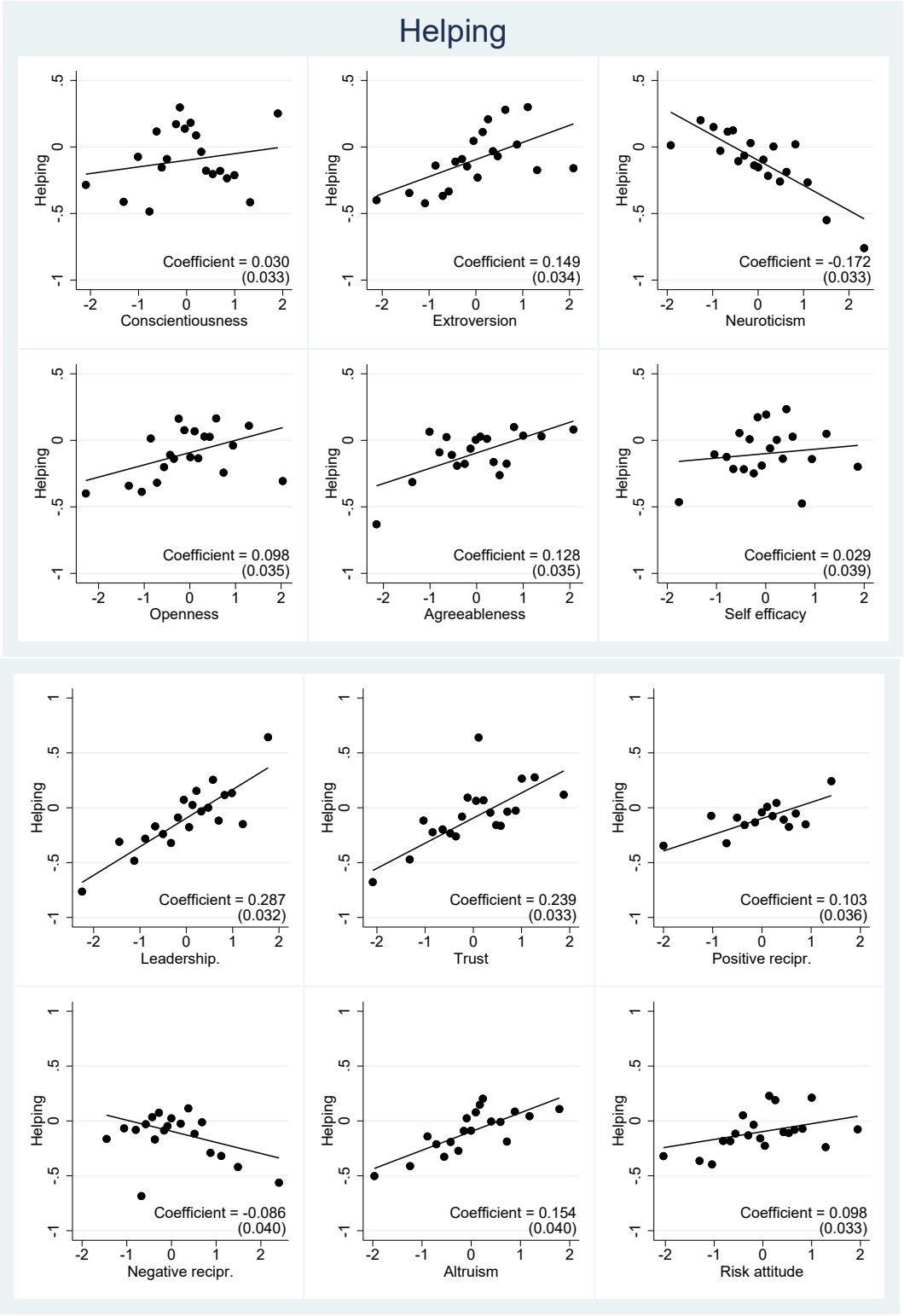


Figure A.9: Bivariate binned scatter plot between helping index (std.) at the firm-wave level and antisocial behavior (std.), and between the two helping items. We use binscatter in Stata. 20 bins estimated. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1. The line shows a bivariate regression, weighted by the number of firm-year obs., and the coefficient of the regression is shown with robust standard errors in parentheses.


Helping
Helping
Conscientiousness
Coefficient = 0.030
(0.033)
Extroversion
Coefficient = 0.149
(0.034)
Neuroticism
Coefficient = -0.172
(0.033)
Openness
Coefficient = 0.098
(0.035)
Agreeableness
Coefficient = 0.128
(0.035)
Self efficacy
Coefficient = 0.029
(0.039)
Leadership.
Coefficient = 0.287
(0.032)
Trust
Coefficient = 0.239
(0.033)
Positive recipr.
Coefficient = 0.103
(0.036)
Negative recipr.
Coefficient = -0.086
(0.040)
Altruism
Coefficient = 0.154
(0.040)
Risk attitude
Coefficient = 0.098
(0.033)

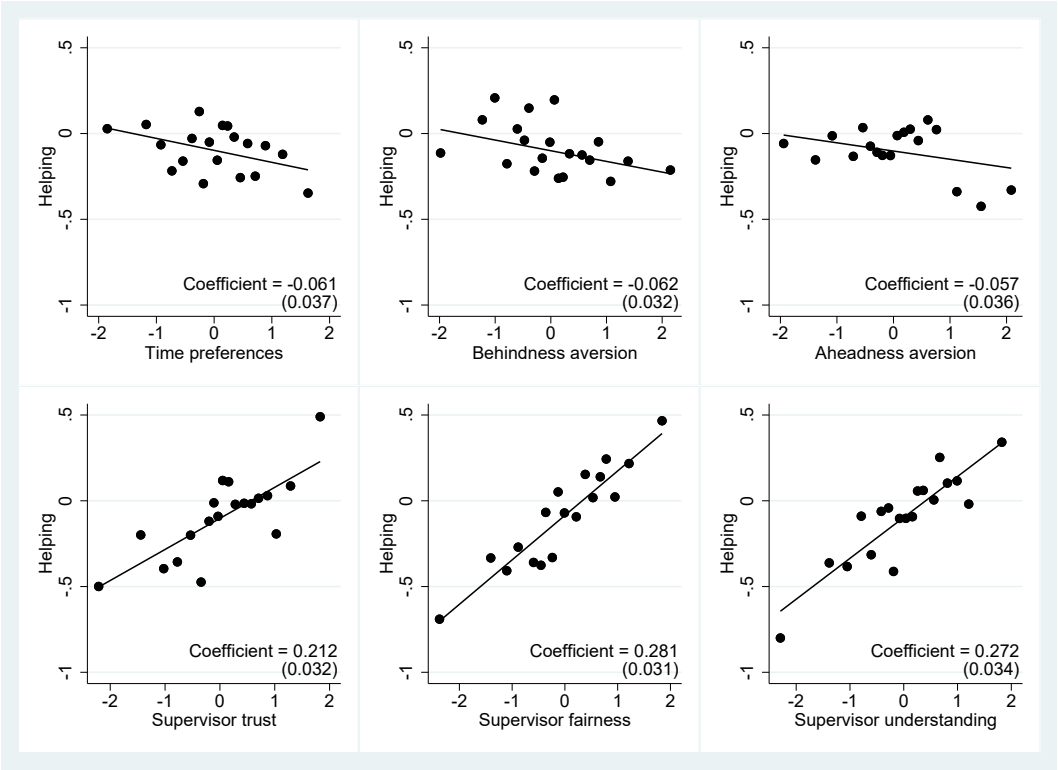
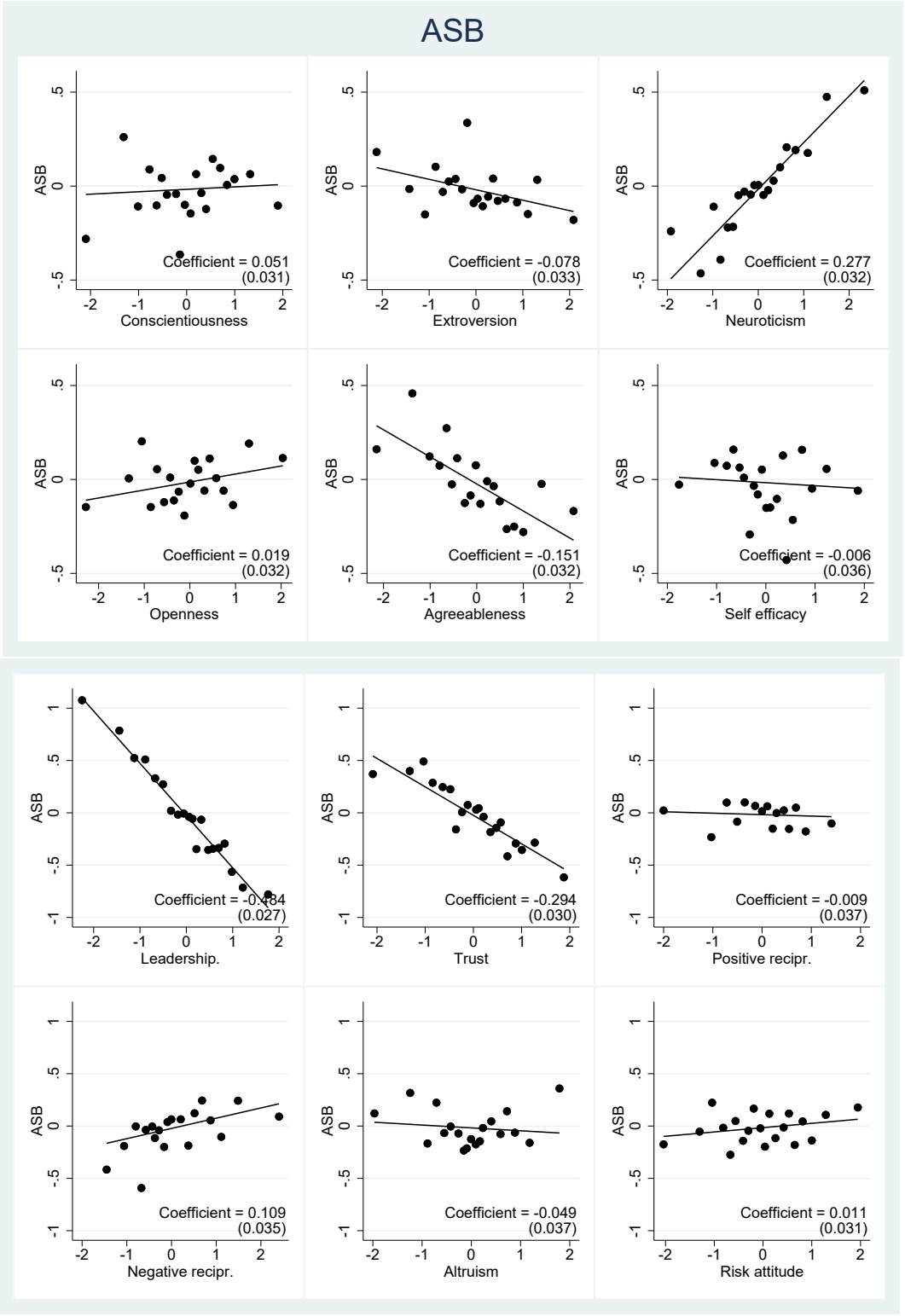


Figure A.10: Bivariate binned scatter plot between helping index (std.) at the firm-wave level and personality (std.), preferences (std.), and leadership variables (std.). We use binscatter in Stata. 20 bins estimated. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1. The line shows a bivariate regression, weighted by the number of firm-year obs., and the coefficient of the regression is shown with robust standard errors in parentheses.


ASB
ASB
Coefficient = 0.051
(0.031)
Conscientiousness
ASB
Coefficient = -0.078
(0.033)
Extroversion
ASB
Coefficient = 0.277
(0.032)
Neuroticism
ASB
Coefficient = 0.019
(0.032)
Openness
ASB
Coefficient = -0.151
(0.032)
Agreeableness
ASB
Coefficient = -0.006
(0.036)
Self efficacy
ASB
Coefficient = -0.484
(0.027)
Leadership.
ASB
Coefficient = -0.294
(0.030)
Trust
ASB
Coefficient = -0.009
(0.037)
Positive recipr.
ASB
Coefficient = 0.109
(0.035)
Negative recipr.
ASB
Coefficient = -0.049
(0.037)
Altruism
ASB
Coefficient = 0.011
(0.031)
Risk attitude

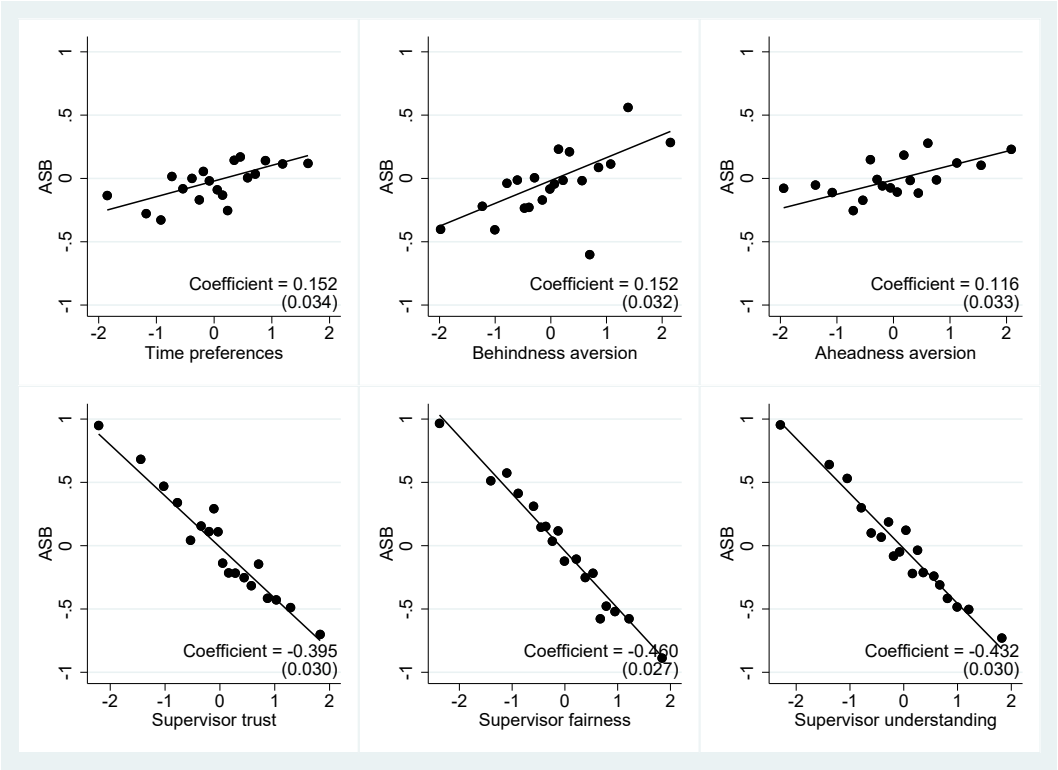
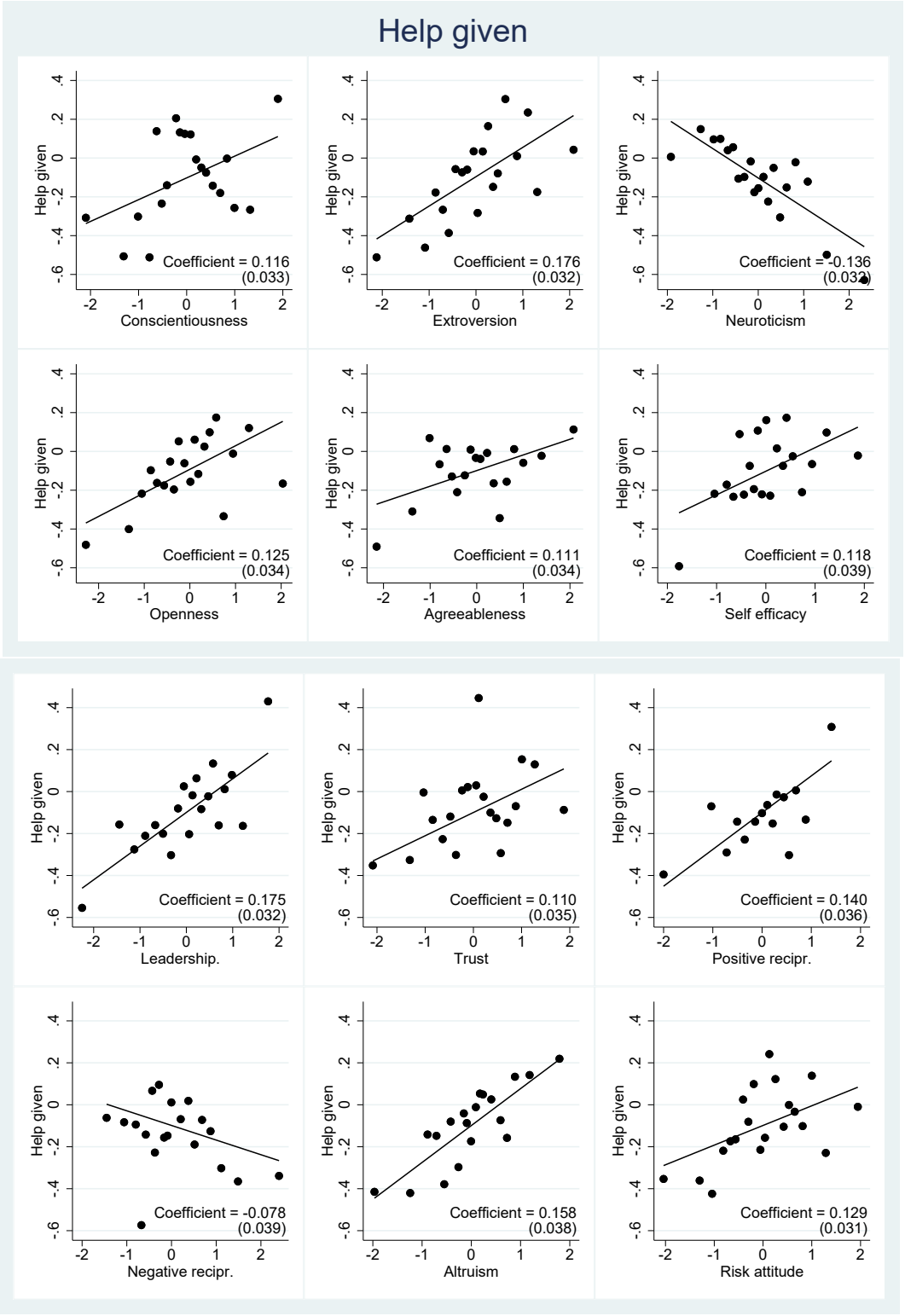


Figure A.11: Bivariate binned scatter plot between antisocial behavior at the firm-wave level (std.) and personality (std.), preferences (std.), and leadership variables (std.). We use binscatter in Stata. 20 bins estimated. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1. The line shows a bivariate regression, weighted by the number of firm-year obs., and the coefficient of the regression is shown with robust standard errors in parentheses.


Help given
Help given
Conscientiousness
Coefficient = 0.116
(0.033)
Extroversion
Coefficient = 0.176
(0.032)
Neuroticism
Coefficient = -0.136
(0.032)
Openness
Coefficient = 0.125
(0.034)
Agreeableness
Coefficient = 0.111
(0.034)
Self efficacy
Coefficient = 0.118
(0.039)
Leadership.
Coefficient = 0.175
(0.032)
Trust
Coefficient = 0.110
(0.035)
Positive recipr.
Coefficient = 0.140
(0.036)
Negative recipr.
Coefficient = -0.078
(0.039)
Altruism
Coefficient = 0.158
(0.038)
Risk attitude
Coefficient = 0.129
(0.031)

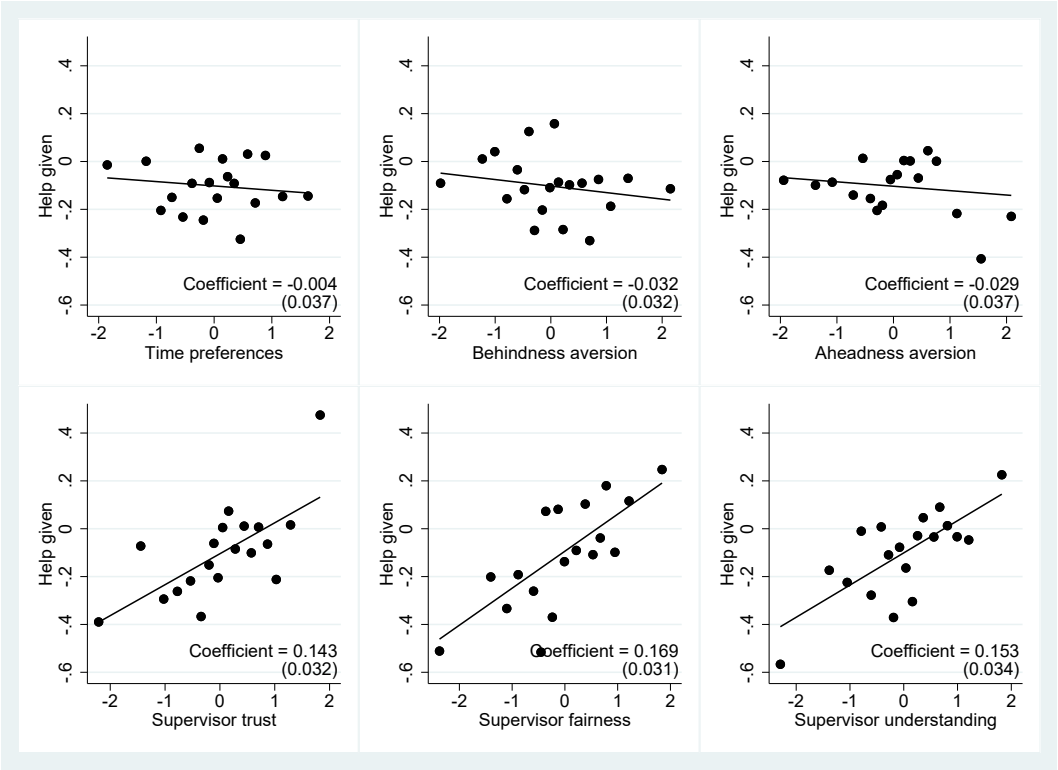
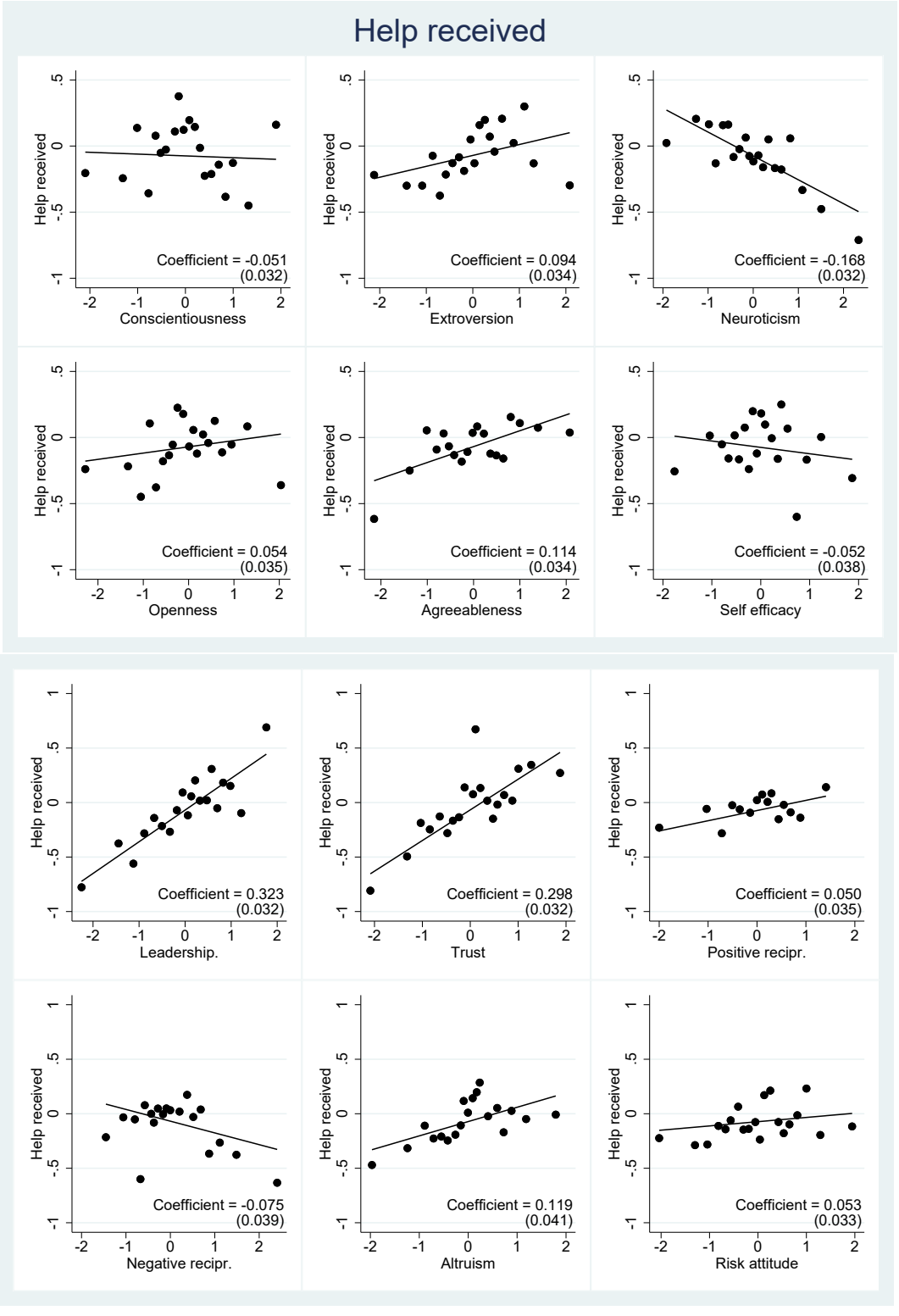


Figure A.12: Bivariate binned scatter plot between help given (std.) at the firm-wave level and personality (std.), preferences (std.), and leadership variables (std.). We use binscatter in Stata. 20 bins estimated. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1. The line shows a bivariate regression, weighted by the number of firm-year obs., and the coefficient of the regression is shown with robust standard errors in parentheses.


Help received
Help received
Conscientiousness
Coefficient = -0.051
(0.032)
Extroversion
Coefficient = 0.094
(0.034)
Neuroticism
Coefficient = -0.168
(0.032)
Openness
Coefficient = 0.054
(0.035)
Agreeableness
Coefficient = 0.114
(0.034)
Self efficacy
Coefficient = -0.052
(0.038)
Leadership.
Coefficient = 0.323
(0.032)
Trust
Coefficient = 0.298
(0.032)
Positive recipr.
Coefficient = 0.050
(0.035)
Negative recipr.
Coefficient = -0.075
(0.039)
Altruism
Coefficient = 0.119
(0.041)
Risk attitude
Coefficient = 0.053
(0.033)

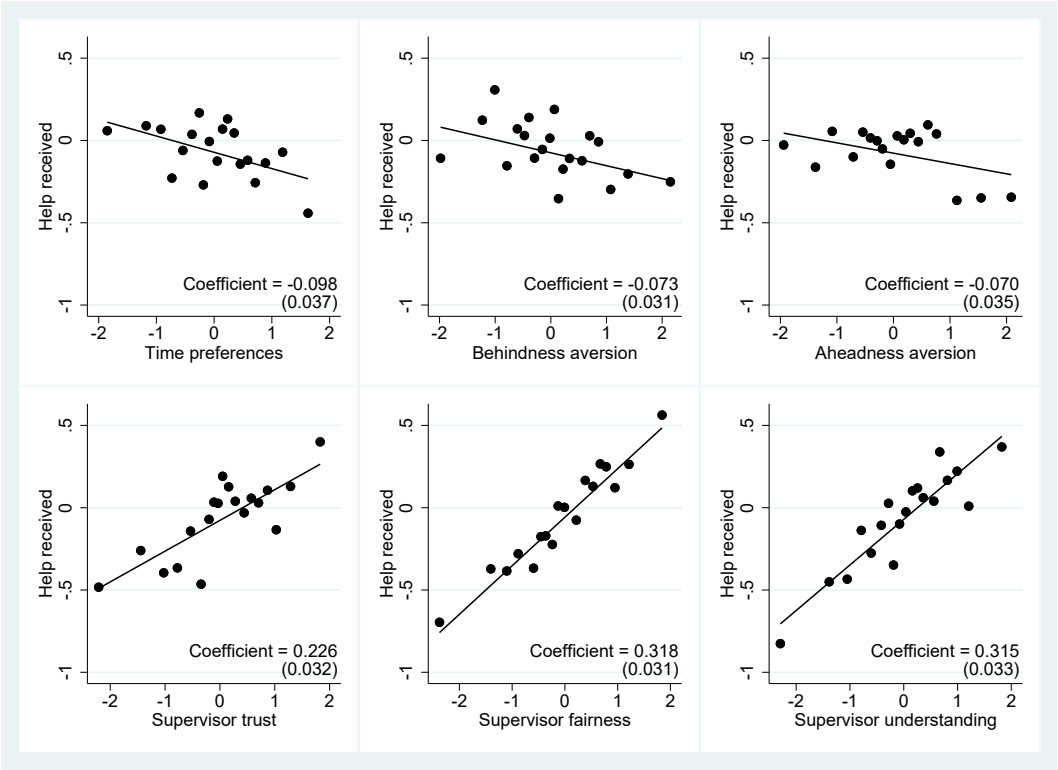


Figure A.13: Bivariate binned scatter plot between help received (std.) at the firm-wave level and personality (std.), preferences (std.), and leadership variables (std.). We use binscatter in Stata. 20 bins estimated. Source: Linked Personnel Panel, waves 2 to 4. N=973 in total. In wave 2 N=456, in wave 3 N=305, in wave 4 N=210. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1. The line shows the bivariate regression, weighted by the number of firm-year obs., and the coefficient of the regression is shown with robust standard errors in parentheses.

A.2 Robustness checks

A.2.1 Individual helping items

Table A.8: Determinants of help given

Dep. variable:	Help given (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Help given$_{t-1}$	0.22***	0.19***	0.18***	0.18***	0.15***	0.14***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Conscientiousness		0.09**	0.10***	0.10**	0.11***	0.11***
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion		0.05	0.03	0.03	0.03	0.03
		(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Neuroticism		-0.10***	-0.09***	-0.08**	-0.03	-0.03
		(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Openness		0.06	0.04	0.04	0.03	0.03
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Agreeableness		0.05	0.02	0.02	0.03	0.03
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Self efficacy		0.01	-0.01	-0.01	-0.02	-0.02
		(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Trust			0.09**	0.08*	0.07	0.06
			(0.04)	(0.04)	(0.04)	(0.04)
Positive recipr.			0.10***	0.10***	0.13***	0.13***
			(0.04)	(0.04)	(0.04)	(0.04)
Negative recipr.			0.00	-0.00	0.01	0.01
			(0.04)	(0.04)	(0.05)	(0.05)
Altruism			0.10***	0.10**	0.09**	0.09**
			(0.04)	(0.04)	(0.04)	(0.04)
Risk attitude			0.04	0.04	0.03	0.03
			(0.03)	(0.03)	(0.04)	(0.04)
Time preferences			-0.01	-0.01	0.01	0.01
			(0.04)	(0.04)	(0.04)	(0.04)
Behindness aversion			0.03	0.03	0.03	0.03
			(0.04)	(0.04)	(0.04)	(0.04)
Aheadness aversion			0.01	0.01	-0.01	-0.01
			(0.04)	(0.04)	(0.04)	(0.04)
Leadership				0.07*	0.08**	0.07**
				(0.03)	(0.04)	(0.04)
ASB$_{t-1}$						-0.04
						(0.03)
Constant	-1.10***	-0.88**	-0.87**	-0.80**	-2.15*	-2.09*
	(0.41)	(0.40)	(0.40)	(0.40)	(1.22)	(1.22)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.12	0.16	0.17	0.18	0.20	0.20
Obs.	973	973	973	973	849	849

The dependent variable "Help given" is the standardized firm-wave average of the associated survey item. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Table A.9: Determinants of help received

Dep. variable:	Help received (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Help received$_{t-1}$	0.35***	0.32***	0.28***	0.26***	0.23***	0.23***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Conscientiousness		0.02	0.03	0.02	0.01	0.01
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion		0.05	0.02	0.03	0.04	0.04
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Neuroticism		-0.08**	-0.05	-0.03	0.01	0.01
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Openness		-0.00	-0.02	-0.03	-0.02	-0.02
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Agreeableness		0.11***	0.08**	0.07*	0.07*	0.07*
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
Self efficacy		-0.04	-0.05	-0.06	-0.06	-0.06
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Trust			0.17***	0.13***	0.15***	0.15***
			(0.04)	(0.04)	(0.04)	(0.04)
Positive recipr.			0.08**	0.08**	0.09**	0.09**
			(0.03)	(0.03)	(0.04)	(0.04)
Negative recipr.			-0.00	-0.01	0.01	0.01
			(0.04)	(0.04)	(0.04)	(0.04)
Altruism			0.09**	0.09**	0.06	0.06
			(0.04)	(0.04)	(0.04)	(0.04)
Risk attitude			0.04	0.04	0.03	0.03
			(0.03)	(0.03)	(0.04)	(0.04)
Time preferences			-0.01	-0.01	0.00	0.00
			(0.04)	(0.04)	(0.04)	(0.04)
Behindness aversion			0.05	0.07**	0.08**	0.08**
			(0.03)	(0.03)	(0.04)	(0.04)
Aheadness aversion			-0.06*	-0.06*	-0.07*	-0.07*
			(0.04)	(0.04)	(0.04)	(0.04)
Leadership				0.19***	0.20***	0.20***
				(0.03)	(0.04)	(0.04)
ASB$_{t-1}$						-0.03
						(0.03)
Constant	-0.72*	-0.49	-0.43	-0.21	0.57	0.61
	(0.43)	(0.42)	(0.42)	(0.41)	(1.37)	(1.37)

Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.21	0.22	0.25	0.28	0.27	0.27
Obs.	973	973	973	973	849	849

The dependent variable "Help received" is the standardized firm-wave average of the associated survey item. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

A.2.2 Individual AKM Fixed Effects controls

Table A.10: Determinants of mutual helping

Dep. variable:	Helping index (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Helping_{t-1}	0.31***	0.29***	0.26***	0.25***	0.22***	0.22***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Ind. AKM $\text{FE}_{2010-2017}$	-0.06*	-0.06*	-0.06*	-0.06*	-0.06*	-0.06*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Conscientiousness		0.03	0.04	0.04	0.04	0.04
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion		0.06*	0.04	0.04	0.03	0.03
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Neuroticism		-0.09***	-0.07**	-0.06	-0.00	-0.00
		(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Openness		0.05	0.02	0.02	0.03	0.03
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Agreeableness		0.08**	0.03	0.03	0.04	0.04
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Self efficacy		-0.02	-0.04	-0.04	-0.04	-0.04
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Trust			0.16***	0.13***	0.13***	0.12***
			(0.04)	(0.04)	(0.04)	(0.04)
Positive recipr.			0.08**	0.08**	0.11***	0.11***
			(0.04)	(0.04)	(0.04)	(0.04)
Negative recipr.			-0.04	-0.04	-0.04	-0.04
			(0.04)	(0.04)	(0.04)	(0.04)
Altruism			0.09**	0.09**	0.07	0.07
			(0.04)	(0.04)	(0.04)	(0.04)
Risk attitude			0.05	0.05	0.05	0.05
			(0.04)	(0.04)	(0.04)	(0.04)
Time preferences			-0.01	-0.01	0.00	0.00
			(0.04)	(0.04)	(0.04)	(0.04)
Behindness aversion			0.04	0.06	0.07*	0.07*

			(0.04)	(0.04)	(0.04)	(0.04)
Aheadness aversion			-0.02	-0.02	-0.04	-0.04
			(0.04)	(0.04)	(0.04)	(0.04)
Leadership				0.14***	0.15***	0.15***
				(0.03)	(0.04)	(0.04)
ASB_{t-1}						-0.02
						(0.03)
Constant	-1.19***	-0.95**	-0.82**	-0.65*	-0.77	-0.74
	(0.40)	(0.39)	(0.39)	(0.39)	(1.08)	(1.07)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.17	0.20	0.22	0.24	0.25	0.25
Obs.	970	970	970	970	847	847

The dependent variable "Helping index" is an index containing the standardized firm-wave average of two items. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Here we include the firm-wave average individual AKM fixed effects from the LIAB data, as calculated from 2010 to 2017. Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Table A.11: Determinants of antisocial behavior

Dep. variable:	Antisocial behavior (ASB) (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
ASB_{t-1}	0.27***	0.21***	0.18***	0.14***	0.13***	0.13***
	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
Ind. AKM $FE_{2010-2017}$	-0.00	0.00	0.01	-0.00	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Conscientiousness		0.09**	0.09**	0.09**	0.11***	0.11***
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion		-0.01	-0.00	-0.00	-0.00	-0.00
		(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
Neuroticism		0.20***	0.17***	0.13***	0.15***	0.15***
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Openness		0.06	0.05	0.07*	0.05	0.05
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Agreeableness		-0.11***	-0.07*	-0.05	-0.04	-0.04
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Self efficacy		-0.03	-0.05	-0.04	-0.06	-0.06
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Trust			-0.19***	-0.11***	-0.10***	-0.10***
			(0.04)	(0.03)	(0.04)	(0.04)
Positive recipr.			-0.02	-0.01	-0.02	-0.02
			(0.04)	(0.03)	(0.04)	(0.04)
Negative recipr.			0.06	0.07**	0.07*	0.07*

			(0.04)	(0.03)	(0.04)	(0.04)
Altruism			0.00	0.01	0.03	0.03
			(0.04)	(0.04)	(0.04)	(0.04)
Risk attitude			0.04	0.04	0.02	0.02
			(0.04)	(0.03)	(0.03)	(0.03)
Time preferences			0.02	0.03	0.02	0.02
			(0.04)	(0.03)	(0.04)	(0.04)
Behindness aversion			0.02	-0.02	-0.01	-0.01
			(0.04)	(0.04)	(0.04)	(0.04)
Aheadness aversion			0.04	0.03	0.03	0.03
			(0.04)	(0.03)	(0.04)	(0.04)
Leadership				-0.40***	-0.39***	-0.39***
				(0.03)	(0.03)	(0.03)
Helping_{t-1}						-0.01
						(0.03)
Constant	0.65*	0.51	0.37	-0.06	-0.19	-0.19
	(0.39)	(0.40)	(0.40)	(0.36)	(1.06)	(1.06)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.12	0.17	0.19	0.33	0.33	0.33
Obs.	970	970	970	970	847	847

The dependent variable is the standardized firm-wave average of antisocial behavior. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Here we include the firm-wave average individual AKM fixed effects from the LIAB data, as calculated from 2010 to 2017. Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

A.2.3 Balanced Panel of Firms

Table A.12: Determinants of mutual helping

Dep. variable:	Helping index (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Helping index}_{t-1}$	0.36***	0.30***	0.27***	0.26***	0.24***	0.24***
	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
Conscientiousness		0.06	0.07	0.08*	0.07	0.07
		(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
Extroversion		0.06	0.05	0.04	0.03	0.03
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Neuroticism		-0.06	-0.03	-0.02	0.03	0.03
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Openness		0.03	0.01	-0.00	0.01	0.01
		(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Agreeableness		0.14***	0.13***	0.12***	0.13***	0.13***
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)

Self efficacy		-0.01	-0.02	-0.03	-0.05	-0.05
		(0.05)	(0.05)	(0.06)	(0.05)	(0.05)
Trust			0.17***	0.13***	0.12***	0.12***
			(0.05)	(0.05)	(0.04)	(0.04)
Positive recipr.			0.04	0.05	0.08*	0.08*
			(0.04)	(0.04)	(0.05)	(0.05)
Negative recipr.			0.07	0.07	0.11**	0.11**
			(0.05)	(0.05)	(0.06)	(0.06)
Altruism			0.10**	0.09**	0.09*	0.09*
			(0.05)	(0.05)	(0.05)	(0.05)
Risk attitude			0.04	0.03	0.03	0.03
			(0.04)	(0.04)	(0.05)	(0.05)
Time preferences			-0.00	-0.01	-0.01	-0.01
			(0.05)	(0.05)	(0.05)	(0.05)
Behindness aversion			0.07*	0.08**	0.09**	0.09**
			(0.04)	(0.04)	(0.04)	(0.04)
Aheadness aversion			-0.04	-0.04	-0.08	-0.08
			(0.05)	(0.05)	(0.05)	(0.05)
Leadership				0.15***	0.16***	0.16***
				(0.04)	(0.04)	(0.04)
ASB_{t-1}						0.00
						(0.04)
Constant	-0.91*	-0.53	-0.51	-0.40	-1.23	-1.23
	(0.54)	(0.49)	(0.50)	(0.50)	(1.73)	(1.73)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.26	0.29	0.31	0.33	0.33	0.33
Obs.	623	623	623	623	565	565

The dependent variable Helping Index is an index containing the standardized firm-wave average of two items. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively. This analysis only uses a balanced panel of firms.

Table A.13: Determinants of anti-social behavior

Dep. variable:	Anti-social behavior (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
ASB_{t-1}	0.31***	0.22***	0.18***	0.12***	0.14***	0.14***
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Conscientiousness		0.09*	0.08*	0.07	0.10**	0.10**
		(0.05)	(0.05)	(0.04)	(0.05)	(0.05)
Extroversion		-0.04	-0.02	-0.01	-0.02	-0.02
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)

Neuroticism		0.26***	0.22***	0.19***	0.18***	0.18***
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Openness		-0.01	0.00	0.02	0.02	0.02
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Agreeableness		-0.12***	-0.07	-0.03	-0.06	-0.06
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Self efficacy		-0.00	-0.06	-0.04	-0.05	-0.05
		(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Trust			-0.23***	-0.14***	-0.11**	-0.11**
			(0.05)	(0.04)	(0.05)	(0.05)
Positive recipr.			-0.03	-0.04	-0.04	-0.04
			(0.05)	(0.05)	(0.05)	(0.05)
Negative recipr.			0.09*	0.08*	0.04	0.04
			(0.05)	(0.05)	(0.05)	(0.05)
Altruism			0.02	0.05	0.06	0.06
			(0.05)	(0.05)	(0.05)	(0.05)
Risk attitude			-0.02	-0.01	-0.04	-0.04
			(0.04)	(0.04)	(0.04)	(0.04)
Time preferences			0.04	0.04	0.05	0.05
			(0.05)	(0.04)	(0.05)	(0.05)
Behindness aversion			-0.04	-0.07	-0.06	-0.06
			(0.05)	(0.05)	(0.05)	(0.05)
Aheadness aversion			0.06	0.05	0.07*	0.07*
			(0.05)	(0.04)	(0.04)	(0.04)
Leadership				-0.37***	-0.39***	-0.39***
				(0.04)	(0.04)	(0.04)
Helping_{t-1}						0.00
						(0.04)
Constant	0.68	0.45	0.38	0.19	-0.13	-0.13
	(0.48)	(0.48)	(0.48)	(0.44)	(1.58)	(1.58)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.14	0.22	0.26	0.36	0.37	0.37
Obs.	623	623	623	623	565	565

The dependent variable is the standardized firm-wave average of antisocial behavior. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively. This analysis only uses a balanced panel of firms.

A.2.4 Pooled Analysis of Firm Observations

Table A.14: Determinants of mutual helping

Dep. variable:	Helping index (std.)

	(1)	(2)	(3)	(4)
Conscientiousness	0.03	0.04	0.04	0.04
	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion	0.06*	0.04	0.03	0.02
	(0.04)	(0.04)	(0.04)	(0.04)
Neuroticism	-0.08**	-0.04	-0.02	-0.03
	(0.03)	(0.03)	(0.03)	(0.03)
Openness	0.06	0.04	0.03	0.02
	(0.04)	(0.04)	(0.03)	(0.03)
Agreeableness	0.12***	0.10***	0.08**	0.10***
	(0.04)	(0.04)	(0.03)	(0.04)
Self efficacy	-0.01	-0.00	-0.00	-0.01
	(0.04)	(0.04)	(0.04)	(0.04)
Trust		0.24***	0.20***	0.18***
		(0.04)	(0.04)	(0.04)
Positive recipr.		0.04	0.04	0.07**
		(0.03)	(0.03)	(0.03)
Negative recipr.		0.01	0.01	0.03
		(0.03)	(0.03)	(0.03)
Altruism		0.08**	0.07**	0.06*
		(0.03)	(0.03)	(0.03)
Risk attitude		0.05*	0.04	0.02
		(0.03)	(0.03)	(0.03)
Time preferences		-0.01	0.00	-0.02
		(0.03)	(0.03)	(0.03)
Behindness aversion		0.07*	0.08**	0.10***
		(0.04)	(0.04)	(0.04)
Aheadness aversion		-0.02	-0.02	-0.04
		(0.04)	(0.04)	(0.04)
Leadership			0.19***	0.17***
			(0.03)	(0.04)
Constant	-1.23	-1.21	-1.35	-3.34**
	(1.03)	(1.06)	(0.97)	(1.63)
Base controls	Yes	Yes	Yes	Yes
Job controls	No	No	No	Yes
HRM practices	No	No	No	Yes
Adj. R-squared	0.13	0.19	0.22	0.24
Obs.	927	925	925	822

The dependent variable Helping Index is an index containing the standardized pooled average of two items. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm on average over all waves in this pooled analysis). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively. This is a pooled analysis, where the firm averages of all variables are constructed using all survey waves.

Table A.15: Determinants of antisocial behavior

Dep. variable:	Antisocial behavior (std.)			
	(1)	(2)	(3)	(4)
Conscientiousness	0.04	0.02	0.03	0.02
	(0.04)	(0.04)	(0.03)	(0.04)
Extroversion	-0.02	-0.02	0.00	-0.00
	(0.03)	(0.03)	(0.03)	(0.03)
Neuroticism	0.20***	0.15***	0.10***	0.12***
	(0.04)	(0.04)	(0.03)	(0.03)
Openness	0.02	0.02	0.05*	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
Agreeableness	-0.14***	-0.12***	-0.08**	-0.08**
	(0.04)	(0.04)	(0.03)	(0.03)
Self efficacy	0.02	0.00	-0.01	-0.00
	(0.03)	(0.03)	(0.03)	(0.03)
Trust		-0.22***	-0.12***	-0.10***
		(0.03)	(0.03)	(0.03)
Positive recipr.		-0.03	-0.03	-0.03
		(0.03)	(0.03)	(0.03)
Negative recipr.		-0.02	-0.01	0.00
		(0.03)	(0.03)	(0.03)
Altruism		-0.01	0.00	-0.01
		(0.03)	(0.03)	(0.03)
Risk attitude		-0.03	-0.01	-0.01
		(0.03)	(0.03)	(0.03)
Time preferences		0.05*	0.03	0.03
		(0.03)	(0.02)	(0.03)
Behindness aversion		0.07*	0.05	0.03
		(0.04)	(0.03)	(0.04)
Aheadness aversion		-0.01	-0.02	-0.02
		(0.03)	(0.03)	(0.03)
Leadership			-0.45***	-0.44***
			(0.03)	(0.03)
Constant	0.05	0.01	0.36	0.93
	(1.06)	(1.10)	(0.88)	(1.53)

Base controls	Yes	Yes	Yes	Yes
Job controls	No	No	No	Yes
HRM practices	No	No	No	Yes
Adj. R-squared	0.15	0.20	0.38	0.39
Obs.	927	925	925	822

The dependent variable is the standardized pooled firm average of antisocial behavior. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm on average over all waves in this pooled analysis). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively. This is a pooled analysis, where the firm averages of all variables are constructed using all survey waves.

A.2.5 No Sample Refreshers

Table A.16: Determinants of mutual helping

Dep. variable:	Helping index (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Helping index$_{t-1}$	0.31***	0.28***	0.27***	0.25***	0.21***	0.21***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
Conscientiousness		0.00	0.00	0.01	-0.02	-0.02
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion		0.01	-0.00	-0.01	0.03	0.03
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Neuroticism		-0.06*	-0.06*	-0.05	0.01	0.01
		(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Openness		0.09**	0.04	0.02	-0.01	-0.01
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Agreeableness		0.10***	0.08**	0.08**	0.12***	0.12***
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Self efficacy		-0.01	-0.07*	-0.07*	-0.11**	-0.11**
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Trust			0.10***	0.08**	0.06	0.05
			(0.03)	(0.03)	(0.04)	(0.04)
Positive recipr.			0.13***	0.13***	0.16***	0.16***
			(0.04)	(0.04)	(0.04)	(0.04)
Negative recipr.			0.01	0.01	0.01	0.01
			(0.04)	(0.04)	(0.04)	(0.04)
Altruism			0.17***	0.16***	0.15***	0.15***
			(0.04)	(0.04)	(0.04)	(0.04)
Risk attitude			0.05	0.05	0.03	0.04
			(0.03)	(0.03)	(0.04)	(0.04)
Time preferences			0.05	0.05	0.05	0.05

			(0.04)	(0.04)	(0.05)	(0.05)
Behindness aversion			0.02	0.03	0.02	0.02
			(0.04)	(0.04)	(0.04)	(0.04)
Aheadness aversion			0.01	0.02	-0.03	-0.03
			(0.04)	(0.04)	(0.04)	(0.04)
Leadership				0.15***	0.16***	0.16***
				(0.04)	(0.04)	(0.04)
ASB_{t-1}						-0.00
						(0.04)
Constant	-0.85**	-0.73*	-0.81*	-0.68*	-1.59	-1.58
	(0.41)	(0.41)	(0.41)	(0.40)	(1.27)	(1.27)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	No
HRM practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.13	0.15	0.20	0.22	0.22	0.22
Obs.	895	893	892	892	768	768

The dependent variable Helping Index is an index containing the standardized firm-wave average of two items. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively. Sample refreshers are excluded from this analysis.

Table A.17: Determinants of antisocial behavior

Dep. variable:	Antisocial behavior (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
ASB_{t-1}	0.33***	0.27***	0.24***	0.19***	0.17***	0.18***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Conscientiousness		0.02	-0.00	-0.02	-0.02	-0.02
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Extroversion		-0.04	-0.05	-0.03	0.01	0.01
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Neuroticism		0.18***	0.14***	0.12***	0.13***	0.14***
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Openness		0.01	0.01	0.04	0.02	0.02
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Agreeableness		-0.08**	-0.05	-0.04	0.01	0.01
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Self efficacy		-0.00	-0.01	-0.01	0.01	0.01
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Trust			-0.14***	-0.09**	-0.07*	-0.08*
			(0.04)	(0.04)	(0.04)	(0.04)
Positive recipr.			-0.07*	-0.07*	-0.09**	-0.09**
			(0.04)	(0.04)	(0.04)	(0.04)
Negative recipr.			0.02	0.02	0.03	0.03

			(0.04)	(0.04)	(0.04)	(0.04)
Altruism			-0.00	0.02	0.02	0.01
			(0.04)	(0.04)	(0.04)	(0.04)
Risk attitude			0.04	0.06	0.04	0.04
			(0.03)	(0.03)	(0.04)	(0.04)
Time preferences			0.06	0.05	0.05	0.05
			(0.04)	(0.04)	(0.04)	(0.04)
Behindness aversion			0.08*	0.06	0.03	0.03
			(0.04)	(0.04)	(0.04)	(0.04)
Aheadness aversion			-0.04	-0.05	0.00	0.00
			(0.04)	(0.04)	(0.04)	(0.04)
Leadership				-0.29***	-0.32***	-0.32***
				(0.03)	(0.04)	(0.04)
Helping_{t-1}						0.02
						(0.03)
Constant	0.41	0.35	0.48	0.28	0.48	0.47
	(0.43)	(0.41)	(0.40)	(0.39)	(1.20)	(1.19)
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	No	No	No	No	Yes	Yes
HRM practices	No	No	No	No	Yes	Yes
Adj. R-squared	0.10	0.14	0.17	0.24	0.25	0.25
Obs.	895	893	892	892	768	768

The dependent variable is the standardized firm-wave average of antisocial behavior. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Job controls include the logarithm of the monthly net wage, white collar, task interdependence, management position, part-time, and fixed-term work contract. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively. Sample refreshers are excluded from this analysis.

A.2.6 IV Results

Table A.18: IV Results: Helping Index

Dep. variable:	Leadership_t	Helping index (std.)	
	(1)	(2)	(3)
	First	IV	RF
Leadership_{t-1}	0.29***		0.10***
	(0.04)		(0.04)
Leadership		0.37***	
		(0.14)	
Constant	-1.19***	-0.64	-1.13**
	(0.41)	(0.51)	(0.49)
Base controls	Yes	Yes	Yes
Preferences	Yes	Yes	Yes
Personality	Yes	Yes	Yes
Obs.	973	973	973

Results show random-effects (RE) instrumental variables regression. The dependent variable "Helping index" is an index containing the standardized firm-wave average of two items. All continuous independent variables are standardized with mean zero and unit variance. Column 1 shows the first stage regression (RE regression) of leadership in wave t on leadership in wave $t-1$ and all other covariates. Column 2 shows the IV results. Column 3 shows the reduced form regression, a RE regression of the dependent variable on the instrument, as well as all other covariates. Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively. Unless stated otherwise, all variables are for wave t.

Table A.19: IV Results: Anti-social behavior

Dep. variable:	Leadership$_t$	ASB (std.)	
	(1)	(2)	(3)
	First	IV	RF
Leadership$_{t-1}$	0.29***		-0.14***
	(0.04)		(0.03)
Leadership		-0.47***	
		(0.09)	
Constant	-1.19***	0.22	0.77*
	(0.41)	(0.43)	(0.43)
Base controls	Yes	Yes	Yes
Preferences	Yes	Yes	Yes
Personality	Yes	Yes	Yes
Obs.	973	973	973

Results show random-effects (RE) instrumental variables regression.The dependent variable is the standardized firm-wave average of anti-social behavior. All continuous independent variables are standardized with mean zero and unit variance. Column 1 shows the first stage regression (RE regression) of leadership in wave t on leadership in wave $t-1$ and and all other covariates. Column 2 shows the IV results. Column 3 shows the reduced form regression, a RE regression of the dependent variable on the instrument, as well as all other covariates. We omit first stages for brevity from management practices IV regressions due to the large number of first stages. Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively. Unless stated otherwise, all variables are for wave t.

Table A.20: Model selection for helping index

	Dependent Variable: Helping index							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Ind. Variables	Controls	Personality	Preferences	Leadership	Mgmt. Pract.	Personality Preferences	Personality Leadership	Personality Mgmt. Practices
Obs.	973	973	973	973	849	973	973	849
AIC	2084.844	2056.946	2038.419	2044.401	1766.069	2031.574	2028.782	1745.292
BIC	2270.299	2271.682	2262.917	2234.736	2017.504	2285.354	2248.399	2025.191
Adj. R^2	.1922	.2196	.2359	.2258	.1870	.2456	.2426	.2119
F-Test Model	6.9010	7.3886	7.5943	8.5184	5.7165	7.4630	8.2686	6.3612
F-Test Pers.		5.70***				2.85***	4.08***	4.99***
F-Test Pref.			7.01***			4.69***		
F-Test Man. P.					1.09			0.87
F-Test Lead.				34.58***			23.75***	

	Dependent Variable: Helping index							
	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Ind. Variables	Preferences Leadership	Preferences Mgmt. Pract.	Leadership Mgmt. Pract.	Personality Preferences Leadership	Personality Preferences Mgmt. Pract.	Personality Leadership Mgmt. Pract.	Preferences Leadership Mgmt. Pract.	Preferences Personality Leadership Mgmt. Pract.
Obs.	973	849	849	973	849	849	849	849
AIC	2013.311	1725.289	1732.159	2011.479	1721.762	1719.254	1703.395	1703.093
BIC	2242.689	2014.677	1988.339	2270.139	2039.614	2003.897	1997.527	2025.689
Adj. R^2	.2560	.2319	.2197	.2618	.2400	.2365	.2523	.2574
F-Test Model	8.4047	6.7120	7.0252	7.9158	6.8014	7.1306	7.4277	7.2071
F-Test Pers.				2.11**	2.39**	3.75***		1.83*
F-Test Pref.	5.34***	6.35***		3.79***	4.48***		4.97***	3.63***
F-Test Man. P.	0.86	1.03	0.90		0.88	0.79	0.91	0.82
F-Test Lead.	22.15***		31.56***	17.78***		23.38***	21.42***	17.83***

The table shows statistics from OLS regression results with different sets of variables included. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Base controls and lagged dependent variable included in each column. The dependent variable "Helping index" is an index containing the standardized firm-wave weighted average of two items. Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Table A.21: Model selection for antisocial behavior

	Dependent Variable: Antisocial behavior							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Ind. Variables	Controls	Personality	Preferences	Leadership	Mgmt. Pract.	Personality Preferences	Personality Leadership	Personality Mgmt. Practices
Obs.	973	973	973	973	849	973	973	849
AIC	2111.282	2054.666	2051.772	1892.623	1804.36	2021.811	1858.028	1760.6
BIC	2296.736	2269.403	2276.27	2082.958	2055.795	2275.591	2077.645	2040.499
Adj. R^2	.1229	.1773	.1814	.3001	.1288	.2108	.3285	.1780
F-Test Model	5.2443	5.9773	6.7845	13.9620	4.2119	7.0987	14.2632	4.7505
F-Test Pers.		8.09***				4.43***	5.96***	6.98***
F-Test Pref.			8.29***			5.93***		
F-Test Man. P.					1.17			1.30
F-Test Lead.				229.45***			202.98***	

	Dependent Variable: Antisocial behavior							
	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Ind. Variables	Preferences Leadership	Preferences Mgmt. Pract.	Leadership Mgmt. Pract.	Personality Preferences Leadership	Personality Preferences Mgmt. Pract.	Personality Leadership Mgmt. Pract.	Preferences Leadership Mgmt. Pract.	Preferences Personality Leadership Mgmt. Pract.
Obs.	973	849	849	973	849	849	849	849
AIC	1872.158	1758.15	1620.566	1850.152	1735.73	1590.547	1606.788	1587.071
BIC	2101.536	2047.538	1876.745	2108.812	2053.582	1875.191	1900.92	1909.667
adj. R^2	.3200	.1822	.2992	.3391	.2086	.3280	0.3165	.3365
F-Test Model	13.7176	5.3749	9.8713	13.4327	5.6614	10.4500	9.8860	10.2755
F-Test Pers.				4.10***	4.74***	5.37***		3.90***
F-Test Pref.	4.49***	6.56***		3.98***	5.45***		3.35**	2.41**
F-Test Man. P.		1.02	1.65*		1.10	1.80**	1.31	1.59*
F-Test Leadership	199.67***		216.87***	183.24***		192.64***	178.26***	170.09***

The table shows statistics from OLS regression results with different sets of variables included. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Base controls and lagged dependent variable included in each column. The dependent variable is the standardized firm-wave weighted average of antisocial behavior. Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.

A.2.7 Leadership items

Table A.22: Leadership items

Dep. variable:	Helping$_t$ (1)	ASB$_t$ (2)	Help given$_t$ (3)	Help received$_t$ (4)
Supervisor trust$_t$	-0.01	-0.10**	0.01	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)
Supervisor fairness$_t$	0.10***	-0.24***	0.04	0.13***
	(0.04)	(0.04)	(0.04)	(0.03)
Supervisor understanding$_t$	0.09*	-0.13***	0.02	0.12***
	(0.04)	(0.04)	(0.05)	(0.05)
Helping$_{t-1}$	0.26***			
	(0.04)			
ASB$_{t-1}$		0.13***		
		(0.03)		
Help given$_{t-1}$			0.18***	
			(0.04)	
Help received$_{t-1}$				0.26***
				(0.04)
Constant	-0.62	0.08	-0.81**	-0.25
	(0.41)	(0.35)	(0.40)	(0.40)
Base controls	Yes	Yes	Yes	Yes
Preferences	Yes	Yes	Yes	Yes
Personality	Yes	Yes	Yes	Yes
Adj. R-squared	0.26	0.34	0.17	0.28
Obs.	973	973	973	973

Results show regressions of mutual helping, ASB, and individual helping items on the leadership items used in the main leadership index in Table A.1. All continuous independent variables are standardized with mean zero and unit variance. We analytically weight observations in the OLS regression by cell size (the number of individual observations per firm-wave cell). Our set of base controls includes school education, vocational and university education, gender, age categories, partner, living alone, interview method, survey wave, industry, region, establishment size, and ownership type. Standard errors clustered on the establishment level in parentheses. The symbols *,**, and *** represent significance levels of 10%, 5%, and 1%, respectively.