

Helping and Antisocial Behavior in the Workplace

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Abstract

Using representative matched employer-employee panel data of German firms, we show that differences in leadership as well as employees' social preferences and personality traits explain firm-level differences in helping and antisocial behavior in the workplace. Our measures are derived from established survey constructs and include preference items that have been behaviorally validated in experimental games by prior research. Together, the empirical results corroborate the importance of (heterogeneity in) social preferences and leadership for the formation of cooperative and non-cooperative workplace cultures, as has been suggested by theory.

Keywords: Helping, antisocial behavior, social preferences, personality, leadership, human resource management

JEL Classification: J31, M51, M52.

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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 within firms, as well as 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? Does “good” leadership promote helping and reduce antisocial behavior among employees? How important are employees’ personality traits, as measured by the Big Five, and economic preferences such as altruism and reciprocity in this relationship? In this paper, we analyze employee helping and antisocial behavior as an integral part of a firm’s organizational culture and working climate (Alan, Corekcioglu, and Sutter, 2021). Based on a unique data set spanning many firms in different industries, we offer a comprehensive analysis of the organizational and individual foundations of these important forms of behavior in the workplace. In doing so, we use a rich set of validated and commonly used constructs including data on employees’ personality traits, economic preferences as well as leadership quality.

Our analysis is based on a novel, representative employer-employee panel data set of larger private establishments in Germany that is particularly appropriate to answer the above research 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 in each survey wave. Second, the data include established and validated survey measures of the quality of leadership (focusing on supervisors’ trust, understanding, and fairness), employees’ personality traits (Big Five), as well as trust and economic preferences (in particular social preferences, but also risk attitude and time discounting) that enable us to investigate to what extent differences along these dimensions explain differences in helping and antisocial behavior. Our survey design allows us to differentiate between time-variant and time-constant drivers of helping and antisocial behavior. Leadership quality is elicited in every survey wave, because leaders often rotate between teams and might develop and adjust their leadership skills over time. As a result, employees typically face leaders of different quality over their careers, which calls for a continuous measurement of leadership quality. On the other hand, personality traits and economic preferences are typically much less affected by workplace events and are considered as rather stable within individuals (Cobb-Clark and Schurer, 2012; Schwaba and Bleidorn, 2018; Fitzenberger et al., 2021). Hence, this information is

¹In 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 and whenever there is no possibility of confusion, we use the terms “firm” and “establishment” interchangeably.

elicited only when an employee is surveyed for the first time. 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 organizational level (cf. Falk et al. (2016, 2018) and references therein). Finally, we exploit a rich set of employee- and establishment-level data to control for important differences in, for example, ability, task interdependencies, industry, firm size, and 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 in the workplace. Our data cover the period from 2012 to 2019 in four survey waves, with about 800 to 1,200 firms and 6,500-8,000 employees participating in each wave. Importantly, sampled firms are drawn in a stratified manner to ensure the sample is representative for firms with more than 50 employees in the private sector. A random sample of employees working within the surveyed establishments are interviewed outside their workplace, typically in the evening. Because we are interested in workplace cultures of helping and antisocial behavior in a given firm, we aggregate the data on the level of the establishment, i.e., our units of observation are establishment-level averages of a particular survey item in a given wave.

Our results document a large variation in helping and antisocial behavior across firms. 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 ($\rho = -0.22$). In fact, there exists a sizable share of firm-wave observations (17 percent) that show above-median levels in *both* types of behavior. These observations indicate that helping and antisocial behavior are rather distinct concepts and one is not just the opposite of the other.

But what explains these firm-level differences? Our first finding shows that leadership quality plays a major role. A one SD increase in leadership quality is associated with a 0.17 SD increase in helping and a 0.41 SD reduction in antisocial behavior, respectively. As our leadership measure varies over time, we can include firm fixed effects. Our results show that the association is robust to this. Next, differences in time-constant social preferences and Big Five personality traits are key predictors of helping and antisocial behavior in the workplace. For example, a one SD increase in the level of altruism or positive reciprocity in an establishment is associated with a 0.19 and 0.26 SD higher level of helping, respectively. With regard to antisocial behavior, we find that personality traits are relatively

more important, in particular neuroticism and openness to experience play a significant role. Here, a one SD increase in each factor is associated with a 0.10 and 0.05 SD increase in antisocial behavior, respectively. Intriguingly, social preferences, while predicting helping, do not explain differences in antisocial behavior. Finally, employees' level of general trust is a strong and significant predictor of both helping and antisocial behavior in the workplace. A one SD higher level of trust is associated with a 0.14 SD increase in helping behavior, and a 0.13 SD decrease in antisocial behavior.

Our results connect and add to several important strands in the literature. With respect to interpersonal interactions in 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. Englmaier et al. (2021) show in a large-scale field experiment that encouraging teams to select leaders has positive effects on team performance. Our measure of leadership, considering a leader's fairness, trust, and understanding towards her employees, can be seen as a proxy for similar social skills to manage people in a given firm. We hence complement the above results by showing in a representative panel of German firms that good people management significantly contributes to explaining firm-level differences in employees' helping and antisocial behavior in the workplace. As both behaviors are significantly associated with employee turnover also in our data (results available upon request), our results further suggest a potential mediating role of helping and antisocial behavior, or more generally workplace climate, in this association.

Next, with respect to the role of 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 Five, 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 also be partly 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. For example, our

results show that trust and social preferences significantly explain helping, while only some personality traits correlate with this behavior. At the same time, personality (neuroticism, openness) explains antisocial behavior, whereas economic preferences do not. This suggests that helping and antisocial behavior are distinct behaviors that are also influenced by different individual traits and preferences.

Our empirical findings are closely 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.²

Finally, the paper connects to a classic literature going back to at least Alchian and Demsetz (1972), Holmstrom (1982), FitzRoy and Kraft (1986), Drago and Turnbull (1988), Drago and Turnbull (1991), Itoh (1991, 1992), Kandel and Lazear (1992), and Rotemberg (1994) that 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; Friebe et al., 2017; Deversi, Kocher, and Schwioren, 2020; Delfgaauw et al., 2022) 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 the determinants of helping and antisocial behavior in 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”, i.e., social preferences, enabling us to address theoretical predictions of Lazear (1989), Kandel and Lazear (1992), and more recently Kosfeld and von Siemens (2009, 2011).

²Other 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.

³Relatively more recent work includes Dur and Sol (2010) and Ishihara (2017).

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 derive our main empirical results. Finally, Section 4 concludes.

2 Data

2.1 The Linked Personnel Panel

Our results make use of a unique data set, the Linked Personnel Panel (LPP), which constitutes a longitudinal linked employer-employee panel data set that is 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, 2020).⁴ The LPP links important variables on the establishment level with rich employee-level information comprising key worker as well as job characteristics. We analyze the four available survey waves from 2012/13, 2014/15, 2016/17, and 2018/19.

The employer survey of the LPP covers between 769 and 1,219 establishments per wave. The sampling started in 2012 with the establishment survey, which was drawn from the IAB establishment panel wave of 2011, a large-scale annual survey of nearly 16,000 German establishments. To ensure that the data set is representative, a stratified disproportionate random sampling approach was used, where establishments were randomly drawn from a matrix stratified by business sector, establishment size, and region.⁵ From an adjusted gross sample of 1,705 establishments, 1,219 valid establishment interviews could be realized leading to a response rate of 72%.

The first LPP employee survey was then launched in December 2012 based on a selection of establishments that had been interviewed in the preceding LPP employer survey. The main selection criteria were the stated willingness of establishments to participate in the 2014 wave of the LPP employer survey and a workforce of at least 50 employees liable to social security contributions as documented in the administrative data. As a result, the total population comprised 300,881 employees from 869 establishments, from which a sample of 37,831 employees was randomly drawn in a disproportionate manner, stratified by establishment size to include not more than 10% of an establishment's workforce in the survey. To avoid that the survey was dominated by few, large establishments, larger

⁴Besides public administration, charity organizations, agriculture, forestry, and fishery are also excluded. The data set 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.

⁵Details on the sampling matrices are provided in Bellmann et al. (2015).

establishments had smaller sampling probabilities. Importantly, the sampling of employees based on administrative social security data mitigates possible selection effects often found in survey data research. In each wave, roughly between 6,500 and 7,500 individuals aged between 18 and 74 are interviewed at home via telephone (CATI) or web interface (CAWI). These interviews take place outside the work environment at different dates, typically in the evening, ensuring that respondents working in the same firm are interviewed independently of each other.

In later survey waves 2 to 4, the LPP sample consists of two groups. First, the employee survey primarily targets panel cases, i.e., individuals, who were surveyed in the previous wave and explicitly expressed their consent to be surveyed again. Furthermore, they need to work in an establishment with a valid LPP employer survey interview in the corresponding wave. The second group comprises a refreshment sample. Here, employees from panel establishments are oversampled in case only a few or no employee interviews were available in the previous wave. For employees whose establishments are new to the LPP survey, a sample is drawn as described above. The data show that, on average, 39 percent of employee-wave observations come from the refreshment sample.

In both surveys, response rates are comparatively high: 79% for the employer and 57% for the employee survey on average. Moreover, there are no significant selection effects on panel participation. This, together with its careful implementation ensuring representativity on the firm level as well as the use of established survey item on the employee level, make the LPP an ideal data source for our research question. For a further detailed description of the LPP see Kampkötter et al. (2016).

2.2 Survey measures

Our survey measures 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 the following, we describe these measures in detail and document their source. An overview on all employee- and establishment-level survey items including their original wording is presented in Tables A.1 and A.2 in the Appendix. Furthermore, summary statistics are provided in Table A.3 in the Appendix.

2.2.1 Helping and antisocial behavior

Helping is measured with two items in 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?”). *Antisocial behavior* is measured with one item

referring to corresponding behavior by both colleagues and superiors (“How often do you feel wrongly criticized, harassed or denounced by your colleagues or superiors?”). Both items of help received and antisocial behavior are based on the Copenhagen Psychosocial Questionnaire (COPSOQ), which has been used in more than 40 countries (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. All variables are standardized with zero mean and unit variance prior to entering the regressions.

The data show that the two helping items are strongly and positively correlated. 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 correlation remains very stable over time, ranging from 0.52 to 0.55. A large share of respondents engage in *mutual help*, i.e. they both offer help when asked and receive help if they ask for it. Precisely, we observe a value of at least 4 (“often”) in 86.7% of person-year observations with respect to help offered, 85.7% with respect to help received, and 82.3% with respect to the average of the two items. Since individual helping behavior is closely linked to the helping behaviors of those an employee interacts with, we take the equally-weighted average of the two helping items as our *helping index* for respondent i in wave t .

The Spearman correlation between the helping index and antisocial behavior at the individual level is significant at the 1% level, but at a rather modest level of -0.26 across all waves. The correlation is stable over time, ranging from -0.23 to -0.27, all significant at the 1% level. Thus, while correlated, the two constructs of helping and antisocial behavior seem to measure substantively different dimensions of interpersonal behavior at the workplace. They are not direct mirrors of one another.

2.2.2 Leadership quality

Employees’ assessment of leadership quality in their establishment is also elicited repeatedly in each survey wave. Similar to Hoffman and Tadelis (2021) we measure good leadership by constructing an equally-weighted *leadership index*, in our case based on three 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), *supervisor fairness* is taken from the interactional justice scale (Kim and Leung, 2007).

2.2.3 Personality traits, social preferences, and trust

To assess an employee’s personality, we apply the *Big Five personality traits* (Costa Jr and McCrae, 1995), which are measured by the Big Five 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).

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* (Falk and Fischbacher, 2006; 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* (Eckel and Grossman, 1996) is similarly elicited by a single item from the PSM. Finally, we measure *trust* (Fehr, 2009) by two of the three items that are commonly used in the SOEP (Dohmen et al., 2008; Naef and Schupp, 2009).

Both 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 stable for working-age adults (Cobb-Clark and Schurer, 2012; Schwaba and Bleidorn, 2018; Fitzenberger et al., 2021). For the regression analyses, we impute these values into all subsequent waves where the same individual is observed.

2.2.4 Controls

Our empirical analysis takes into account a rich set of control variables on both the employee and the establishment level.

On the employee level, a key challenge is to control for differences in *employee ability* as these are likely to be associated with both individual demand and supply of helping. In addition to using information on employee education (see below), a notable feature of our data is that we have access to individual AKM/CHK fixed effects (Abowd, Kramarz, and Margolis, 1999; Card, Heining, and Kline, 2013). These individual fixed effects, which have also been used by Bender et al. (2018), are calculated using the full sample of German social security data (the IAB Employment History File (BEH)) for the period 2010-2017 (hence, extending the procedure by Card, Heining, and Kline (2013)), which covers most of our sample period (Bellmann et al., 2020).⁶ The estimated fixed effects are imputed across all individual observations.

We next include information about an employee’s level of *education*. Precisely, we include

⁶Detailed information about the LPP-ADIAB is provided via DOI: 10.5164/IAB.FDZD.1907.en.v1.

dummies for six school education categories (no school certificate, 9th grade (Hauptschule), 10th grade (Realschule), 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). Further, we control for *gender*, *age* categories (under 30, 30 to 40, 40 to 50, and above 50), an indicator for having a *life partner*, and an indicator for *living alone*. We also control for employees' *risk attitude*, *time preferences*, and *self-efficacy*. 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). Time preferences are operationalized via two items from the PSM (Falk et al., 2016). 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.

To control for differences in employees' job characteristics, we include individual-level information about *task interdependencies*, which is elicited by two items asking whether an employee's tasks depend on the input of colleagues, and whether colleagues' tasks depend on an employee's own task fulfillment. Finally, we include an *interview method* dummy (CATI vs. CAWI).

On the establishment level, our controls include relevant information about *industry* (manufacturing; metal, electronics, and automotive; retail, logistics, and media; company-related and financial services; IT, communication, and other services), *region* (east, south, west, north), *establishment size* (less than 50 employees, 50 to 99 employees, 100 to 249, 250 to 499, and more than 500)⁷, as well as *ownership* type (family firm, management, investor or dispersed ownership, (partly) state-owned, and other). In addition, we include survey wave fixed effects.

Next, establishment managers provide information about the use of *human resource management (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 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.

⁷Some of the smallest establishments may shrink in size over time and are then allocated to the category "less than 50 employees".

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 establishment 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 establishment.⁸

3 Results

In our empirical analysis, we aggregate all individual-level variables on the establishment level for each survey wave. We use the terms *establishment* and *firm* interchangeably whenever there is no possibility of confusion. Hence, our unit of observation is establishment, or firm, f in survey wave t . These equally-weighted establishment-wave-averages are calculated for establishments with at least three observations per wave.⁹ By doing so, we not only reduce measurement error that may occur at the individual level, such as common method bias, but we explicitly take an organizational-culture perspective on the manifestation and foundations of helping and antisocial behavior.

We first document the variation in helping and antisocial behavior across firms based on our representative data. We then come to our main research question: What explains these firm-level differences in helping and antisocial behavior? In the remainder of this chapter, we present our empirical strategy, followed by the main results.

3.1 Helping and antisocial behavior across firms

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”). As the figure shows, there is substantial heterogeneity in helping behavior across firms. For antisocial behavior, the distribution is right-skewed and most firm averages range between 1 (“never or nearly never”) and 2 (“seldom”). Still, the observed heterogeneity seems striking.¹⁰

⁸We also include dummies for all missing covariates at the firm level, which were not elicited in the first survey wave. In these cases, the associated variables are set to the same value for the missing values. Thus, our data make use of all firm-wave observations where helping or antisocial behavior was measured from survey waves 1 to 4.

⁹The number of employees sampled per establishment is increasing in establishment size. At the 10th percentile, we observe about 3 employees per establishment-wave cell, at the 50th percentile 6, at the 90th percentile 18, and at the 99th percentile 38 employees. The average number of employees per establishment-wave cell is 9.

¹⁰In 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 between waves 1 and 2 ($p < 0.0000$), as

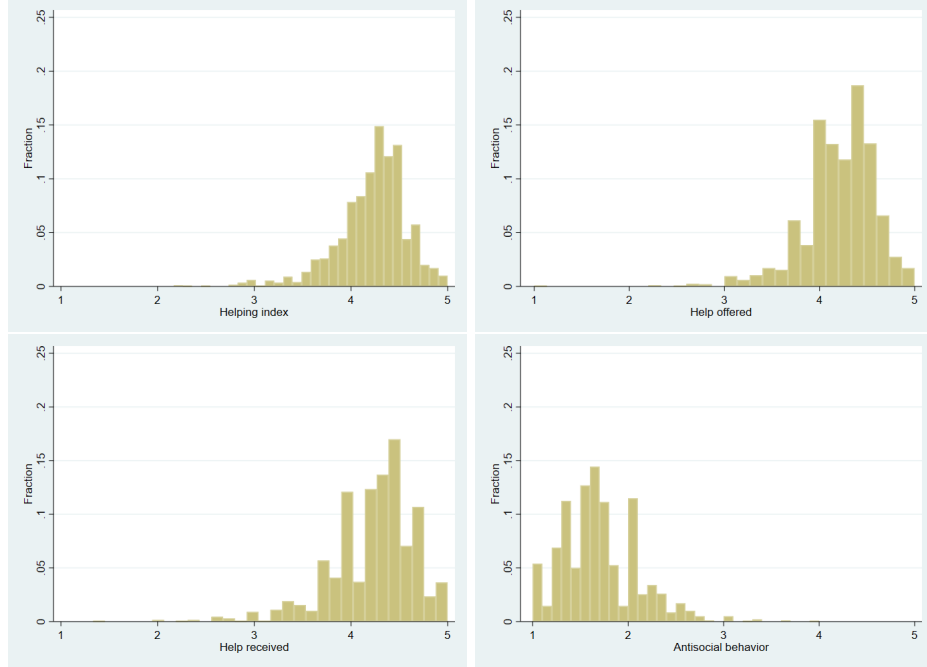


Figure 1: Distribution of establishment-wave averages of the helping index, help offered, help received, and antisocial behavior. Source: Linked Personnel Panel, waves 1 to 4 (regression sample). Survey items are shown in Table A.1. $N=2,002$ per histogram. Only establishments with at least three employee respondents per wave used. One observation is the average response within one establishment-wave cell.

Similar to our findings on the individual level, the firm-level data reveal that helping and antisocial behavior are rather distinct concepts, not just opposites of each other. While helping and antisocial behavior are significantly negatively correlated at the firm level, the correlation size is also rather modest (Spearman $\rho = -0.22$ across all waves, $p < 0.0000$). Figure 2 shows a scatter plot of both outcome measures. As can be seen, there is considerable variation in antisocial behavior for all levels of helping. Further analysis in the Appendix confirms this impression. Table A.4 reports 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 firms with above-median helping are more likely to have below-median antisocial behavior and vice versa (Pearson Chi-squared and Fisher's exact tests significant at $p < 0.000$). Nevertheless, in 35% of all firm-year observations in which helping is above the median, antisocial behavior is also above the median (corresponding to 17% of all firm-wave observations).¹¹

well as between waves 3 and 4 ($p < 0.0000$). The difference in distributions between waves 2 and 3 is not statistically significant ($p = 0.688$). The data show that helping cultures become more heterogeneous in the population of firms over time. For antisocial behavior, we observe a somewhat similar pattern, where the distribution significantly changes from waves 3 to 4 ($p < 0.000$), but stays similar from waves 1 to 2 ($p = 0.212$) and 2 to 3 ($p = 0.324$).

¹¹We provide further descriptive information in Tables A.5 to A.6 in the Appendix. Distributional plots of our main variables, pooled and across waves, are shown in Figures A.1 to A.10 in the Appendix.

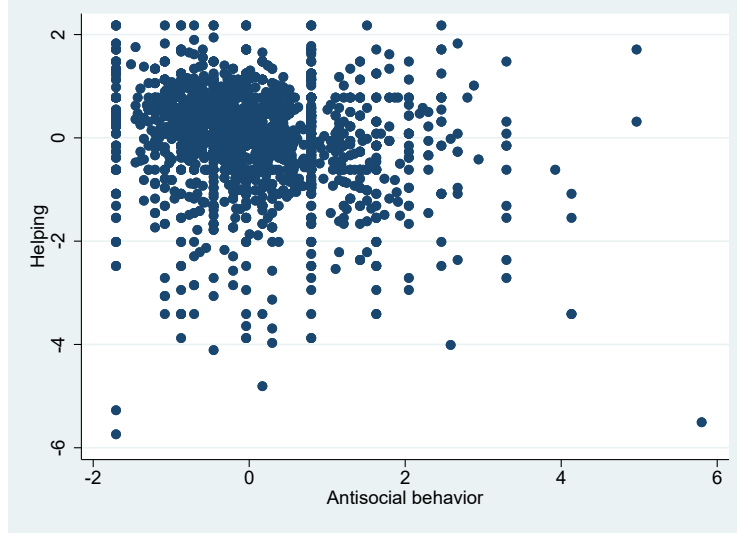


Figure 2: Scatter plot between helping index (std.) and antisocial behavior (std.) at the firm-wave level. Source: Linked Personnel Panel, waves 1 to 4. N=2,002. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items are shown in Table A.1.

3.2 Empirical strategy

What explains the observed heterogeneity in helping and antisocial behavior across firms? To answer this question, we pursue the following empirical strategy. We first regress the standardized firm-level outcome variables ($Y_{f,t}$) in a firm f at wave t on each of our three main groups of explanatory variables, using the following regression equation:

$$Y_{f,t} = \alpha + \beta_1 EXPLANATORY_{f,t} + \beta_2 CONTROLS_{f,t} + \theta_t + \varepsilon_{f,t}.$$

The main independent firm-level variables ($EXPLANATORY_{f,t}$) are either leadership quality ($LEADERSHIP_{f,t}$), Big Five personality traits ($PERSONALITY_{f,t}$), or economic preferences and trust ($PREFERENCES_{f,t}$).

The outcome variables are either helping ($HELP_{f,t}$) or antisocial behavior ($ASB_{f,t}$). Unless stated otherwise, all continuous independent variables are standardized firm-wave averages. The regressions are weighted by the number of observations per firm-wave cell (i.e., the number of employees contributing to the firm-wave average), with standard errors clustered at the firm level. All regressions include our full set of control variables ($CONTROLS_{f,t}$) and survey wave fixed-effects (θ_t). We next simultaneously include all three groups of explanatory variables and estimate the following regression

equation in the full model:

$$Y_{f,t} = \alpha + \beta_1 LEADERSHIP_{f,t} + \beta_2 PERSONALITY_{f,t} + \beta_3 PREFERENCES_{f,t} + \beta_4 CONTROLS_{f,t} + \theta_t + \varepsilon_{f,t}.$$

Therefore, we can study whether leadership, personality traits, economic preferences, and trust have distinct additional explanatory power. This type of analysis also shows whether different constructs such as personality traits, social preferences, or leadership quality are complements or instead substitutes (Becker et al., 2012).

We consider two main robustness checks. First, we add the lagged dependent variable (LDV), $Y_{f,t-1}$, to mitigate reverse causation (simultaneity bias). The latter could arise from time-varying unobserved characteristics, such as the sorting of workers into firms based on helping or antisocial behavior (Angrist and Pischke, 2008; Beckmann and Kräkel, 2022). The LDV approach also serves to further reduce potential common method bias. Second, as we elicit leadership quality in every survey wave, we run a firm fixed-effects regression to study the link between leadership quality and our outcome variables, while accounting for time-invariant omitted variables at the firm level. We cannot conduct analogous firm fixed-effects regressions to examine the explanatory power of personality traits, social preferences, and trust. The reason is that we elicit these characteristics only the first time an individual joins the employee survey. Hence, any firm-level differences here would require substantial changes in the workforce composition, which we do not observe.

3.3 Explaining helping across firms

Table 1 contains our results for helping in the workplace as the dependent variable. We first study whether leadership quality positively correlates with helping in firms. The results reported in column (1) show that leadership quality is positively associated with subordinates' cooperative behavior. The effect size is substantial: a one SD increase in leadership quality is associated with a 0.22 SD increase in helping. The specification in column (4) indicates that, although the coefficient is slightly smaller, leadership quality remains positively and significantly correlated with helping even when simultaneously including personality traits, social preferences, and trust in the regression. The specification reported in column (5) shows that although slightly smaller, the link between leadership and helping remains substantial and significant also when including the lagged dependent variable to mitigate reverse causation and common method bias. Finally, column (6) reports the results of our firm fixed-

effects regression. The results in the table indicate that a within-firm increase in leadership quality by one SD is associated with a 0.20 SD increase in helping behavior. Our findings strongly suggest that leadership quality is an essential driver of helping in firms. These results are consistent with Kosfeld (2020) and Hoffman and Tadelis (2021) who find that good leadership induces cooperation among followers and reduces employee turnover. Our data also support the argument that good leadership might signal followers that helping is profitable or an advantageous social norm (Hermalin, 1998; Potters, Sefton, and Vesterlund, 2007; Sliwka, 2007; Danilov and Sliwka, 2017) and that leaders may sustain helping as an equilibrium within groups by fairly punishing defectors and rewarding helpers (Kosfeld and Rustagi, 2015).

We next consider the association between employees' personality traits and helping. The results reported in column (2) document more helping in firms with higher average agreeableness, extroversion, and openness. The coefficients are large, but smaller compared to the coefficient on leadership quality: a one SD increase in agreeableness is associated with a 0.12 SD increase in helping, a one SD increase in extroversion is associated with a 0.07 SD increase in helping, and a one SD increase in openness is associated with a 0.05 SD increase in helping. Neuroticism is negatively correlated with helping, where a one SD increase in average neuroticism is associated with a 0.06 SD decrease in helping. These results are very intuitive, as, for instance, laboratory experiments show that agreeableness is associated with cooperative tendencies like helping (Kagel and McGee, 2014; Proto, Rustichini, and Sofianos, 2019). Extroverted employees are more communicative and socializing, and openness to experience relates to curiosity and willingness to engage in team processes. Therefore, both extroversion and openness should promote helping. Neurotic individuals are overly concerned with envy, insecure, and generally worried with themselves; this likely reduces the willingness to engage in mutual helping with colleagues.

Although the above findings are intuitive, the relationship between personality traits and helping is not quite robust. The results reported in column (4) show that the negative correlation between neuroticism and helping is halved and no longer statistically significant if we include leadership quality, social preferences, and trust in the regression. The estimated coefficient for agreeableness is smaller, although still positively and significantly correlated. Further including the lagged dependent variable, the findings reported in column (5) reveal that neuroticism and agreeableness are no longer significantly correlated with helping. We instead observe a weakly significant positive link between conscientiousness and helping, a relationship we do not find in any other specifications.

What might explain that neuroticism and agreeableness are no longer significantly correlated with helping once we include the lagged dependent variable in the regression? In this specification,

we lose all data points for which we do not observe helping in the previous wave. The resulting loss in statistical power might explain why the correlation between agreeableness and helping is no longer significant. But also the magnitudes (although not the signs) of the estimated coefficients change once including the lagged dependent variable. It is also possible that the relationship between personality traits and helping is different in the reduced sample compared to the overall sample. To further study this possibility, we run the specification without lagged dependent variable reported in column (4) but with the smaller sample used in our regression with the lagged dependent variable as reported in column (5). We find weakly significant positive correlations of helping with conscientiousness and agreeableness, similar to those in our specification with the lagged dependent variable, but no significant link with neuroticism. The findings on personality traits in our specification with the lagged dependent variable thus seem to be driven by both a loss in statistical power and a slightly different composition of the sample of considered firms. We conclude that the association between personality traits and helping in firms is not quite robust, at least not as robust as the relationship between leadership and helping.

We next investigate whether social preferences and trust are associated with helping in firms. The results reported in column (3) show that positive reciprocity, altruism, and trust correlate positively with firm-level helping behavior. The effect sizes are once again substantial and comparable to leadership quality. In particular, a one SD increase in trust is associated with a 0.20 SD increase in helping, a one SD increase in positive reciprocity is associated with a 0.27 SD increase in helping, and a one SD increase in altruism is associated with a 0.24 SD increase in helping. The results reported in columns (4) and (5) show that the results remain qualitatively the same when including leadership quality, personality traits, and the lagged dependent variable in the regressions.

The strong correlations between helping, social preferences and trust are intuitive and support existing findings from laboratory and field experiments. Concerning social preferences, positive reciprocity generally describes the willingness to return a favor (Dohmen et al., 2009), and altruism captures the unconditional willingness to support others (Andreoni, 1990; Fehr and Fischbacher, 2003). Both types of social preferences should be positively related to helping and cooperation by definition. Field studies indeed show that prosocial preferences are associated with various kinds of helping behavior (Rustagi, Engel, and Kosfeld, 2010; Falk et al., 2018). Further, the theoretical arguments in Kosfeld and von Siemens (2009, 2011) suggest that employees with social preferences self-select into specific firms, creating corporate cultures of cooperation. There exists indeed ample laboratory evidence showing a relation between group formation, social preferences, and voluntary cooperative

outcomes (Gächter and Thöni, 2005; Brekke et al., 2011; Gülerk, Irlenbusch, and Rockenbach, 2014). Our evidence complements these laboratory findings by showing that social preferences are associated with cooperative cultures in the corporate context of representative German firms. Concerning trust, the existing literature suggests that trust should be positively associated with cooperation in general and in organizations (see La Porta et al. (1997) and the references therein). For example, trust is necessary to offer help in case it is provided if and only if one expects help to be returned, and employees might only ask for help if they trust others to do the work properly. Trust differs from social preferences because it additionally captures the beliefs of an individual about being able to rely on others and betrayal aversion (Fehr, 2009). Gächter et al. (2012) and Miettinen et al. (2020) indeed document that beliefs about others' cooperation is a positive predictor for one's own cooperation.

Table 1: Determinants of mutual helping

Dep. variable:	Helping index (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Leadership	0.2209*** (0.0233)			0.1678*** (0.0236)	0.1475*** (0.0344)	0.2018*** (0.0534)
Conscientiousness		0.0147 (0.0259)		0.0254 (0.0254)	0.0669* (0.0362)	
Extroversion		0.0661** (0.0258)		0.0515** (0.0255)	0.0270 (0.0357)	
Neuroticism		-0.0637** (0.0255)		-0.0315 (0.0256)	-0.0348 (0.0346)	
Openness		0.0494* (0.0277)		0.0258 (0.0264)	0.0050 (0.0378)	
Agreeableness		0.1196*** (0.0263)		0.0813*** (0.0257)	0.0415 (0.0384)	
Trust			0.1957*** (0.0290)	0.1388*** (0.0294)	0.1218*** (0.0408)	
Positive recipr.			0.2723** (0.1090)	0.2580** (0.1089)	0.5049*** (0.1627)	
Negative recipr.			-0.0073 (0.0372)	0.0281 (0.0370)	0.0023 (0.0577)	
Altruism			0.2427*** (0.0823)	0.1873** (0.0787)	0.2877** (0.1236)	
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Individual ability	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	Yes	Yes	Yes	Yes	Yes	Yes
HRM practices	Yes	Yes	Yes	Yes	Yes	Yes
Lag helping	No	No	No	No	Yes	No
Firm fixed effects	No	No	No	No	No	Yes
Adj. R-squared	0.19	0.18	0.19	0.23	0.28	0.38
Obs.	2,002	2,002	2,002	2,002	973	2,002

The dependent variable “Helping index” is an index containing the standardized firm-wave average of two helping items. All continuous independent variables of interest 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 time and risk preferences, self-efficacy, 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. Individual ability is proxied by the firm-wave average of individual AKM fixed effects from the LIAB data, as calculated from 2010 to 2017. Standard errors clustered on the establishment level in parentheses. The symbols *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

3.4 Explaining antisocial behavior across firms

Table 2 contains our results for antisocial behavior in the workplace as the dependent variable. We first study whether leadership quality is related to antisocial behavior in firms. Looking at the results reported in column (1), we observe a large estimated coefficient for leadership quality. A one SD larger average leadership quality is associated with a 0.46 SD lower antisocial behavior in a given firm. As with helping, the relationship between leadership and antisocial behavior appears to be very robust. The results reported in columns (4) and (5) show that the coefficient on leadership always remains highly significant and very similar in size when including personality traits, social preferences, trust, and the lagged dependent variable in the regressions. Our last specification with firm fixed-effects, reported in column (6), confirms that leadership quality remains negatively associated with antisocial behavior even in a within-firm analysis.

Our results on leadership are consistent with the idea that good leaders reduce antisocial behavior by punishing unwanted and rewarding good behavior (Kosfeld, 2020). Such leadership behavior helps to create a good team climate, which in turn reduces antisocial behavior among employees (Alan, Corekcioglu, and Sutter, 2021). Note that the coefficient size for leadership quality is larger than when explaining mutual help. One possible reason for this result could be that the questionnaire item measuring antisocial behavior specifically includes superiors as perpetrators, while those measuring helping only focus on colleagues.

We next investigate the link between employees' personality traits and antisocial behavior. The results reported in column (2) show that extroversion and agreeableness are negatively correlated, while neuroticism is positively correlated with antisocial behavior. In detail, a one SD higher level of extroversion is associated with a 0.05 SD lower level of antisocial behavior and a one SD higher level of agreeableness is associated with a 0.10 SD lower level of antisocial behavior. On the other hand, a one SD higher level of neuroticism is associated with a 0.16 SD higher level of antisocial behavior. Our results are again very intuitive. In particular, we would expect less antisocial behavior among more agreeable employees. Neuroticism is a likely candidate to explain the level of antisocial behavior in a given firm, because it could easily be associated with misunderstandings between employees. The results reported in columns (4) and (5) show that the link between antisocial behavior and neuroticism appears to be very robust. The relevant coefficient remains similar in size and always highly significant in all specifications. As with helping, the link between the other personality traits and antisocial behavior appears to be less robust. Concerning agreeableness, we find that the negative relationship with antisocial behavior becomes much smaller and only marginally significant when including leadership,

social preferences, and trust in our specification. The coefficient is no longer significant once we include the lagged dependent variable. Instead, we observe a somewhat puzzling positive relationship between openness and antisocial behavior in the specifications reported in columns (4) and (5).

We finally consider the link between social preferences and antisocial behavior. Social preferences seem differently linked to antisocial behavior than to helping. The results reported in column (3) suggest that only trust is significantly correlated with antisocial behavior. A one SD increase in trust is associated with a 0.25 SD decrease in antisocial behavior. This result seems plausible, because colleagues who do not trust each other are more likely to end up in conflict. For example, if an employee distrusts her colleagues and consequently behaves in a controlling and uncooperative way, this could lead to a vicious cycle of antisocial behavior. The results reported in columns (4) and (5) show that the negative relationship between antisocial behavior and trust remains significant if we include leadership quality, personality traits, social preferences, and the lagged dependent variable in the regressions.

Table 2: Determinants of antisocial behavior

Dep. variable:	Antisocial behavior (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Leadership	-0.4567*** (0.0213)			-0.4144*** (0.0209)	-0.4073*** (0.0284)	-0.4478*** (0.0510)
Conscientiousness		0.0352 (0.0260)		0.0269 (0.0231)	0.0560 (0.0350)	
Extroversion		-0.0465* (0.0247)		-0.0217 (0.0213)	-0.0065 (0.0297)	
Neuroticism		0.1637*** (0.0262)		0.1010*** (0.0241)	0.1441*** (0.0329)	
Openness		0.0147 (0.0256)		0.0486** (0.0223)	0.0688** (0.0319)	
Agreeableness		-0.1047*** (0.0273)		-0.0426* (0.0244)	-0.0511 (0.0335)	
Trust			-0.2513*** (0.0255)	-0.1281*** (0.0224)	-0.1122*** (0.0321)	
Positive recipr.			-0.0084 (0.1139)	-0.0850 (0.1001)	-0.1719 (0.1528)	
Negative recipr.			0.0331 (0.0371)	0.0196 (0.0326)	0.0582 (0.0476)	
Altruism			-0.0954 (0.0838)	-0.0434 (0.0706)	0.0488 (0.1092)	
Base controls	Yes	Yes	Yes	Yes	Yes	Yes
Individual ability	Yes	Yes	Yes	Yes	Yes	Yes
Job controls	Yes	Yes	Yes	Yes	Yes	Yes
HRM practices	Yes	Yes	Yes	Yes	Yes	Yes
Lag antisocial behavior	No	No	No	No	Yes	No
Firm fixed effects	No	No	No	No	No	Yes
Adj. R-squared	0.29	0.13	0.15	0.31	0.36	0.42
Obs.	2,002	2,002	2,002	2,002	973	2,002

The dependent variable is the standardized firm-wave average of antisocial behavior. All continuous independent variables of interest 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 time and risk preferences, self-efficacy, 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. Individual ability is proxied by the firm-wave average of individual AKM fixed effects from the LIAB data, as calculated from 2010 to 2017. Standard errors clustered on the establishment level in parentheses. The symbols *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

4 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 in the workplace. Our data are representative of a large, developed economy and cover a substantial period. The surveys apply experimentally validated items to measure social preferences, and they use other established measures from validated scales to measure trust, personality traits, and leadership quality. Finally, the data provide 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 in 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. 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, leadership quality 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 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 explanatory power in explaining 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)	Repeatedly measured	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
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
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." (R) B: "On the whole, one can trust people."	5-point
Big 5: Openness to experience	No	"I see myself as someone who..." A: "is original, comes up with new ideas." B: "values artistic, aesthetic experiences." "C: has an active imagination." D: "is eager for knowledge."	5-point
Big 5: Extroversion	No	"I see myself as someone who..." A: "is communicative, talkative." B: "is reserved." (R) C: "is outgoing, sociable:"	5-point
Big 5: Conscientiousness	No	"I see myself as someone who..." A: "does a thorough job." B: "tends to be lazy." (R) C: "does things effectively and efficiently."	5-point
Big 5: Agreeableness	No	"I see myself as someone who..." A: "is sometimes somewhat rude to others." (R) B: "has a forgiving nature." C: "is considerate and kind to others."	5-point
Big 5: Neuroticism	No	"I see myself as someone who..." A: "worries a lot." B: "gets nervous easily" C: "is relaxed, handles stress well" (R)	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." (R)	5-point

(R): Reverse-coded

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

Survey item	Repeatedly measured	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 (weighted by number of employees)

	Obs.	Mean	S.D.	Min.	Max.	Med.
Number of employees (unweighted)	2,002	9.2	17.2	3	536	6
Helping index	2,002	4.2	0.3	2.2	5	4.3
Help offered	2,002	4.2	0.3	1	5	4.2
Help received	2,002	4.3	0.3	1.3	5	4.3
Antisocial behavior	2,002	1.7	0.3	1	4	1.6
Sick days	2,002	12.3	9.4	0	95	9.6
AKM ind. FE _{2010–2017}	1,996	4.2	0.2	3.3	5.2	4.2
Trust	2,002	3.5	0.3	1.9	4.6	3.5
Positive reciprocity	1,793	4.5	0.2	2	5	4.5
Negative reciprocity	1,793	1.9	0.4	1	5	1.9
Altruism	1,793	7.7	0.6	4	10	7.7
Risk tolerance	2,002	5.6	0.6	1.8	8.5	5.6
Time preference	1,792	3	0.3	1	5	3
Conscientiousness	2,002	4.4	0.2	3.2	5	4.3
Extroversion	2,002	3.7	0.3	2.3	4.9	3.7
Neuroticism	2,002	2.7	0.3	1.3	4	2.7
Openness	2,002	3.6	0.2	2.3	4.9	3.7
Agreeableness	2,002	4	0.2	2.9	5	4
Self efficacy	1,793	4.2	0.2	3	5	4.2
Leadership	2,002	3.8	0.3	1.9	5	3.8
Supervisor trust	2,002	3.8	0.4	1.3	5	3.8
Supervisor understanding	2,002	3.7	0.4	1.2	5	3.8
Supervisor fairness	2,002	3.9	0.4	1.3	5	4
Feedback talk	2,002	0.8	0.4	0	1	1
Development plan	2,001	0.6	0.5	0	1	1
Performance appraisal	2,001	0.7	0.4	0	1	1
Employee survey	2,000	0.5	0.5	0	1	1
Code of conduct	2,001	0.5	0.5	0	1	0
Low performer	1,992	3.5	0.7	1	5	3.5
Target agreement	1,644	0.9	0.3	0	1	1
Work climate important	1,998	4.3	0.7	1	5	4
Ind. PP empl.	2,002	0.4	0.5	0	1	0
Team PP empl.	2,002	0.2	0.4	0	1	0
Firm PP empl.	2,002	0.3	0.5	0	1	0
Ind. PP man.	2,002	0.5	0.5	0	1	0
Team PP man.	2,002	0.3	0.5	0	1	0
Firm PP man.	2,002	0.5	0.5	0	1	1
Share staff PP	2,002	33	42.5	0	100	4
Depend on me	2,002	3.8	0.5	1	5	3.8
Depend on others	2,002	3.4	0.5	1	5	3.4
White-collar	2,002	0.6	0.3	0	1	0.7
Management position	2,002	0.3	0.2	0	1	0.3
Part-time	2,002	0.1	0.2	0	1	0.1
Log monthly net wage	2,001	7.7	0.4	4	9.9	7.7
Fixed-term work contract	2,002	0	0.1	0	1	0
Female	2,002	0.3	0.2	0	1	0.2
Under 30 years	2,002	0.1	0.1	0	0.8	0.1
30-40 years old	2,002	0.2	0.1	0	1	0.2

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Table A.3 – *Continued from previous page*

	Obs.	Mean	S.D.	Min.	Max.	Med.
40-50 years old	2,002	0.3	0.2	0	1	0.3
Partner	2,002	0.8	0.1	0	1	0.9
Lives alone	2,002	0.1	0.1	0	1	0.1
No school certificate	2,002	0	0	0	0.3	0
9th grade	2,002	0.2	0.2	0	1	0.2
10th grade	2,002	0.4	0.2	0	1	0.4
Univ. of app. sc. entrance qual.	2,002	0.1	0.1	0	1	0.1
University entrance qualification	2,002	0.2	0.2	0	1	0.2
Other school education	2,002	0	0	0	1	0
No further education	2,002	0	0.1	0	1	0
Apprenticeship	2,002	0.5	0.2	0	1	0.5
Trade school	2,002	0.1	0.1	0	1	0.1
Master craftsman	2,002	0.2	0.2	0	1	0.2
Univ. of appl. sciences	2,002	0.1	0.1	0	1	0.1
University	2,002	0.1	0.1	0	1	0.1
Other further education	2,002	0	0	0	0.3	0
North	2,002	0.2	0.4	0	1	0
East	2,002	0.2	0.4	0	1	0
South	2,002	0.3	0.4	0	1	0
West	2,002	0.3	0.5	0	1	0
Under 50	2,002	0	0.1	0	1	0
50-99	2,002	0.1	0.3	0	1	0
100-249	2,002	0.2	0.4	0	1	0
250-499	2,002	0.2	0.4	0	1	0
Above 500	2,002	0.4	0.5	0	1	0
Manufact.	2,002	0.3	0.5	0	1	0
Metal	2,002	0.4	0.5	0	1	0
Commerce	2,002	0.1	0.3	0	1	0
Bus./fin. serv.	2,002	0.1	0.3	0	1	0
IT/oth. serv.	2,002	0	0.2	0	1	0
Health/Social	2,002	0	0.2	0	1	0
Family owned	2,002	0.4	0.5	0	1	0
Management-owned	2,002	0.1	0.4	0	1	0
Financial inv./Dispersed ownership	2,002	0.2	0.4	0	1	0
State-owned	2,002	0	0.2	0	1	0
Other ownership type	2,002	0.2	0.4	0	1	0
CATI	2,002	0.9	0.3	0	1	1
Wave 1	2,002	0.3	0.5	0	1	0
Wave 2	2,002	0.3	0.4	0	1	0
Wave 3	2,002	0.2	0.4	0	1	0
Wave 4	2,002	0.2	0.4	0	1	0

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

	ASB $\leq$ median	ASB $>$ median	Total
Helping $\leq$ median	472 (47%)	531 (53%)	1,003 (100%)
Helping $>$ median	653 (65%)	346 (35%)	999 (100%)
Total observations	1,125	877	2,002

The table shows a two-way contingency table of above and below median helping index and antisocial behavior (ASB) at the firm-wave 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 1 to 4. One observation of the helping (ASB) index is the firm-wave average.

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

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
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 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 averages of helping index and antisocial behavior and firm-wave level coefficients of variation (CV) of 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 the 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

Helping				
Sector	Wave 1	Wave 2	Wave 3	Wave 4
Manufact.	4.30	4.24	4.26	4.13
Metal	4.34	4.26	4.25	4.09
Commerce	4.31	4.13	4.19	3.96
Bus./fin. serv.	4.27	4.22	4.25	4.10
IT/oth. serv.	4.35	4.28	4.22	4.09
Health/Social	4.30	4.20	4.24	4.02
Total	4.31	4.23	4.25	4.10

Antisocial behavior

Sector	Wave 1	Wave 2	Wave 3	Wave 4
Manufact.	1.69	1.66	1.65	1.73
Metal	1.64	1.66	1.65	1.75
Commerce	1.69	1.72	1.58	1.76
Bus./fin. serv.	1.63	1.57	1.48	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 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	0.44
Metal	0.48	0.48	0.48	0.49
Commerce	0.51	0.51	0.46	0.49
Bus./fin. serv.	0.48	0.47	0.45	0.44
IT/oth. serv.	0.45	0.45	0.45	0.50
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 helping index and antisocial behavior as well as firm-wave level coefficients of variation (CV) of helping index and antisocial behavior, across industry sectors and 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 $N = 2,002$.

A.1.1 Distribution of main variables

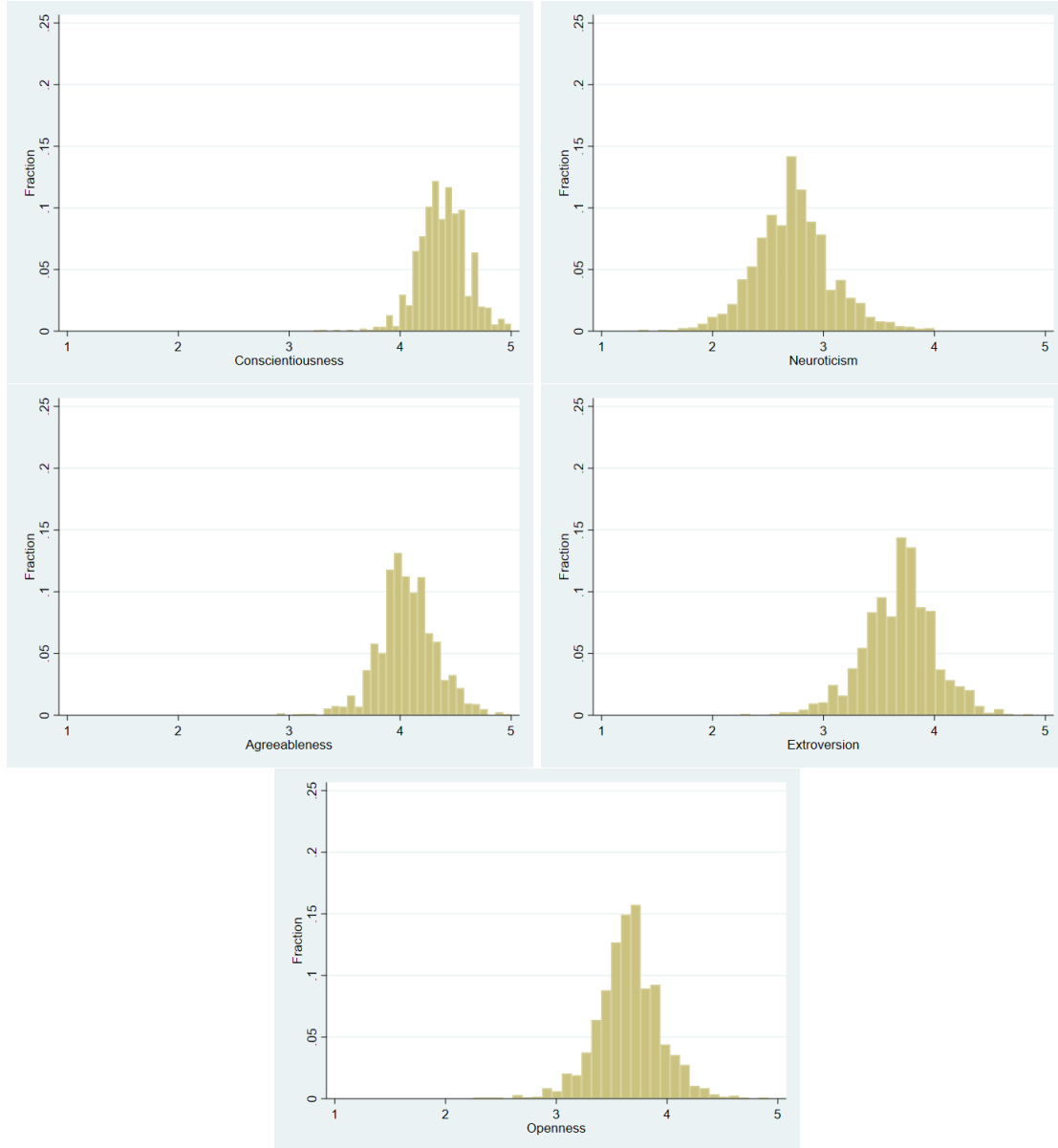


Figure A.1: Distribution of Big Five personality traits. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3: N=451, wave 4: N=286. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

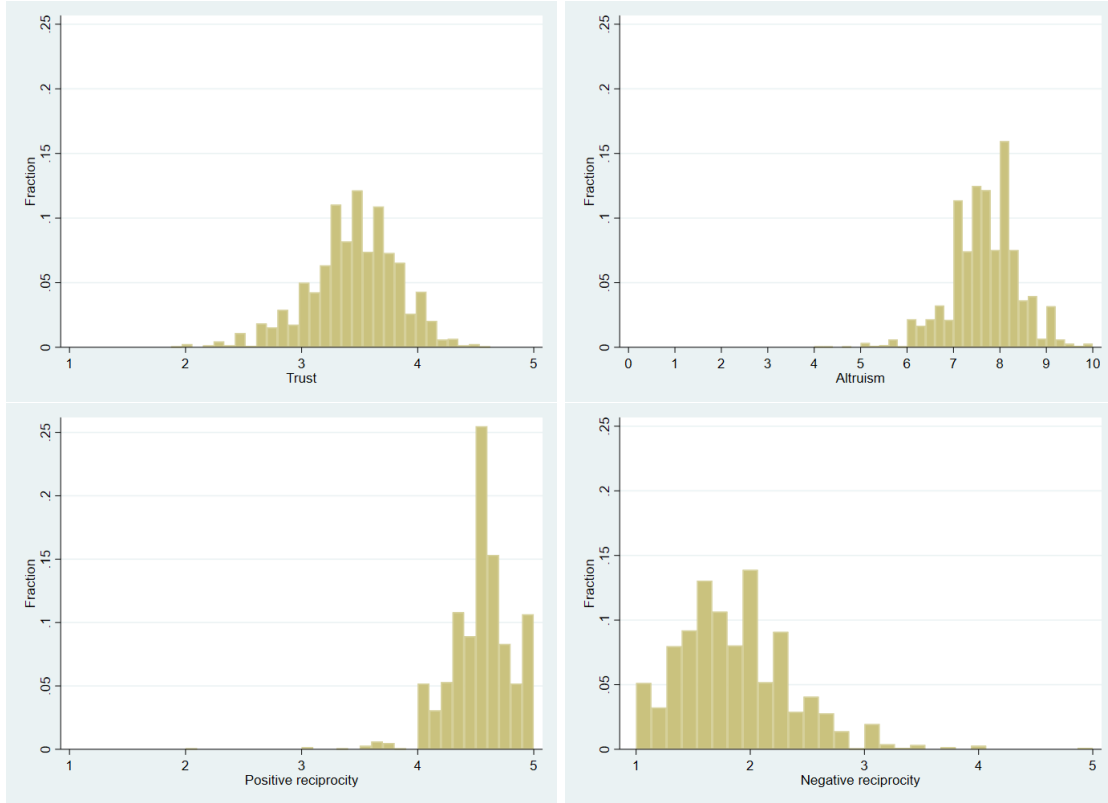


Figure A.2: Firm-wave level averages of preferences in waves 1 to 4. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3: N=451, wave 4 N=286, except positive reciprocity, negative reciprocity, and altruism (each wave 1: N=515, wave 2: N=541, wave 3: N=451, wave 4 N=286). 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.

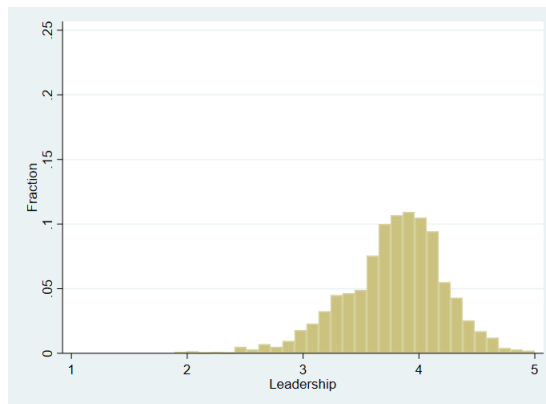


Figure A.3: Distribution of establishment-level averages of the leadership index. The leadership index is the equally weighted average of three items, supervisor trust, supervisor understanding and supervisor fairness. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3: N=451, wave 4 N=286. 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.

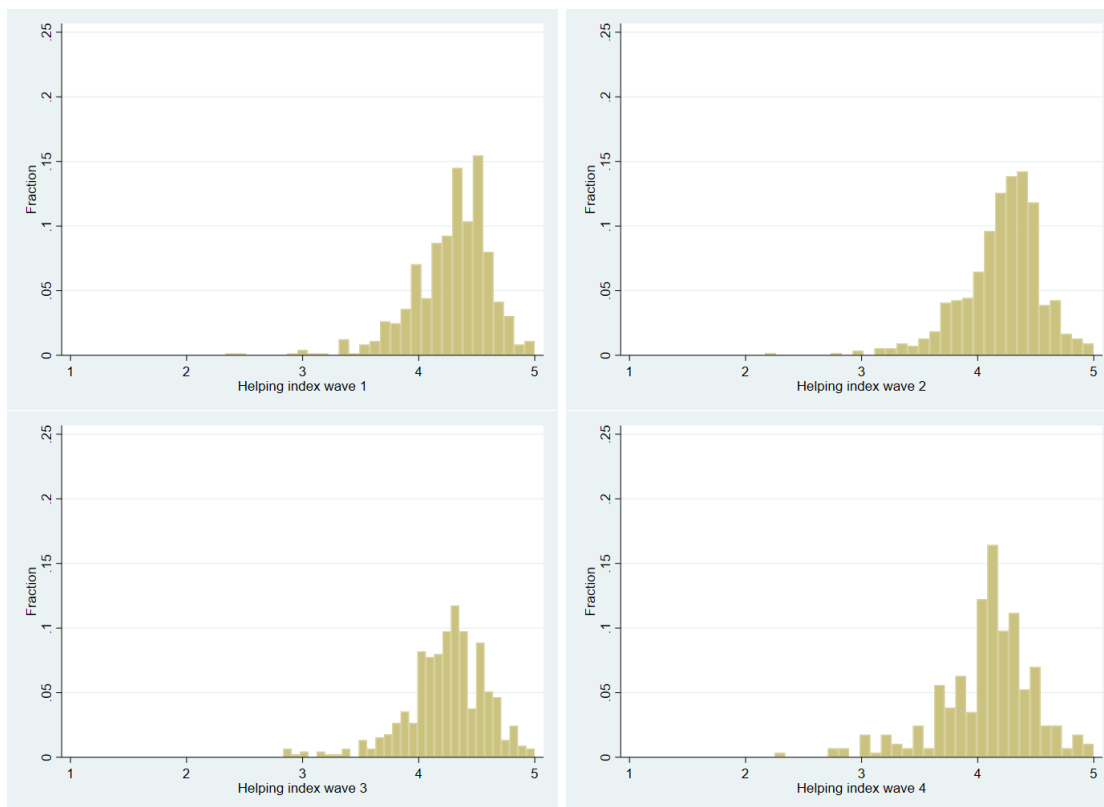


Figure A.4: Distribution of the establishment-wave average helping index by wave. Source: Linked Personnel Panel, waves 1 to 4. $N=2,002$ in total. Wave 1: $N=724$, wave 2: $N=541$, wave 3: $N=451$, wave 4: $N=286$. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

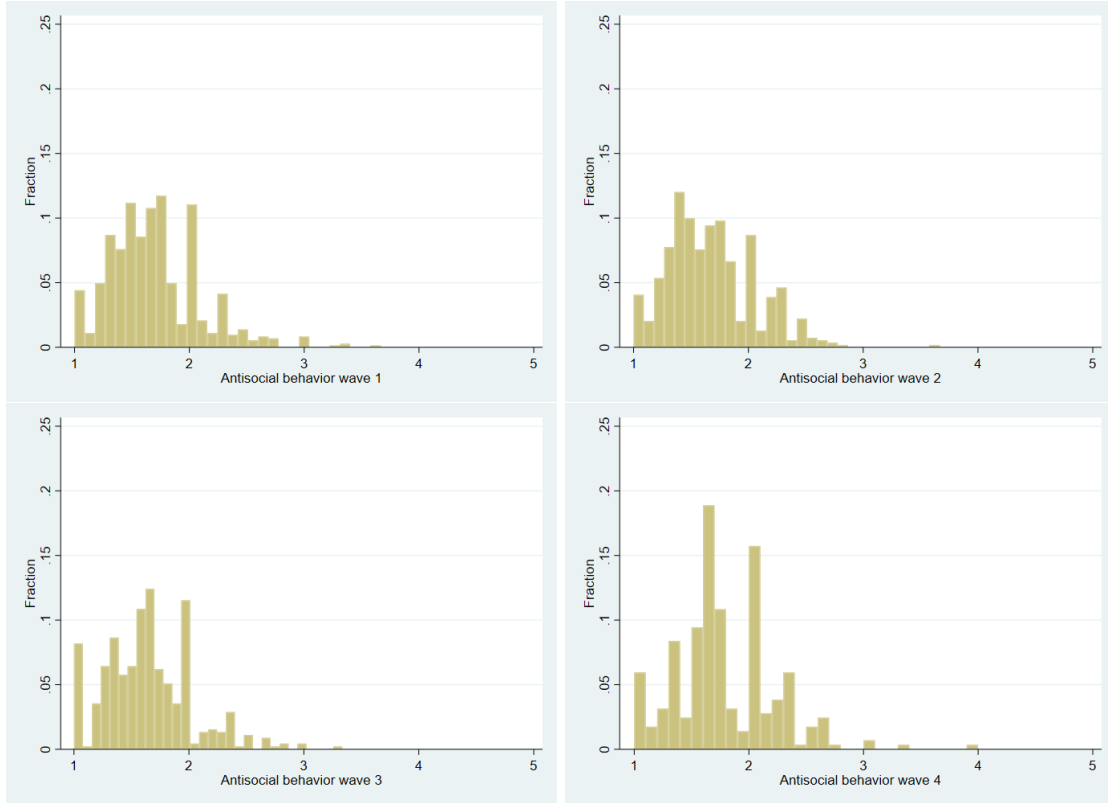


Figure A.5: Distribution of antisocial behavior of establishments by wave. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. In wave1 N=724, wave 2 N=541, in wave 3 N=451, in wave 4 N=286. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

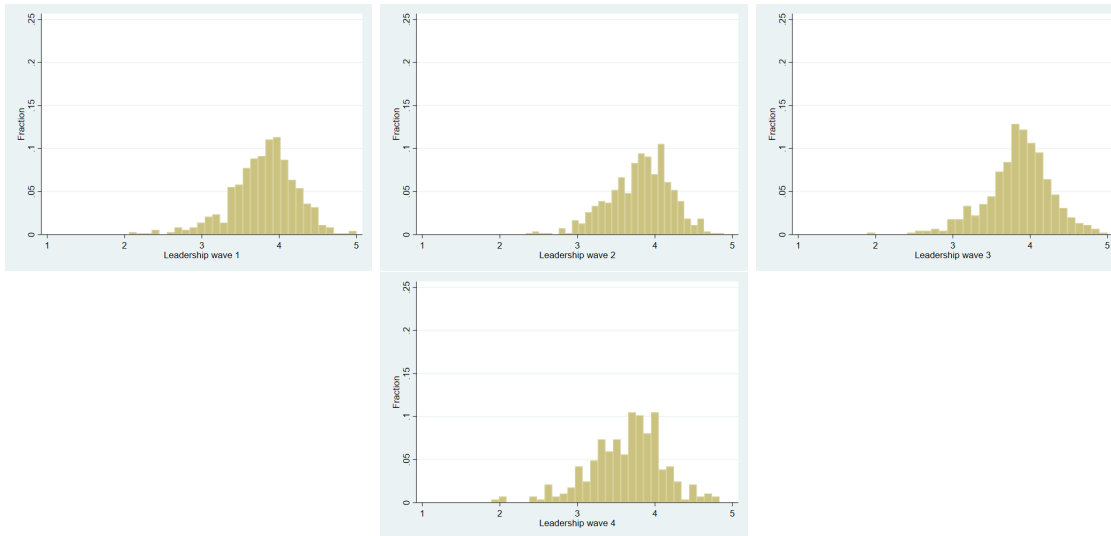


Figure A.6: Distribution of the leadership index by wave. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave: 3 N=451, wave: 4 N=286. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

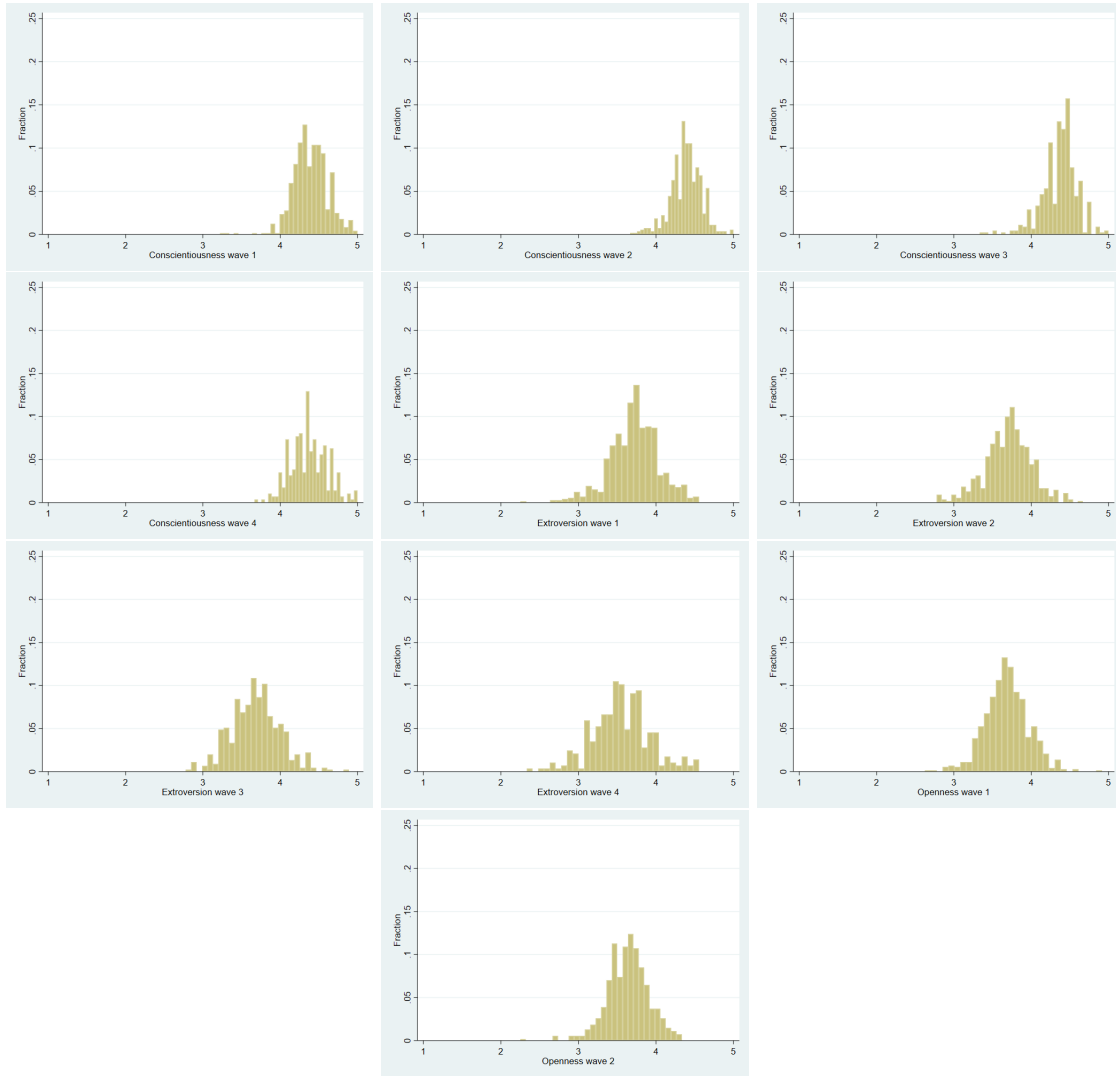


Figure A.7: Distribution of Big Five personality traits by wave. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3: N=451, wave 4: N=286. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.

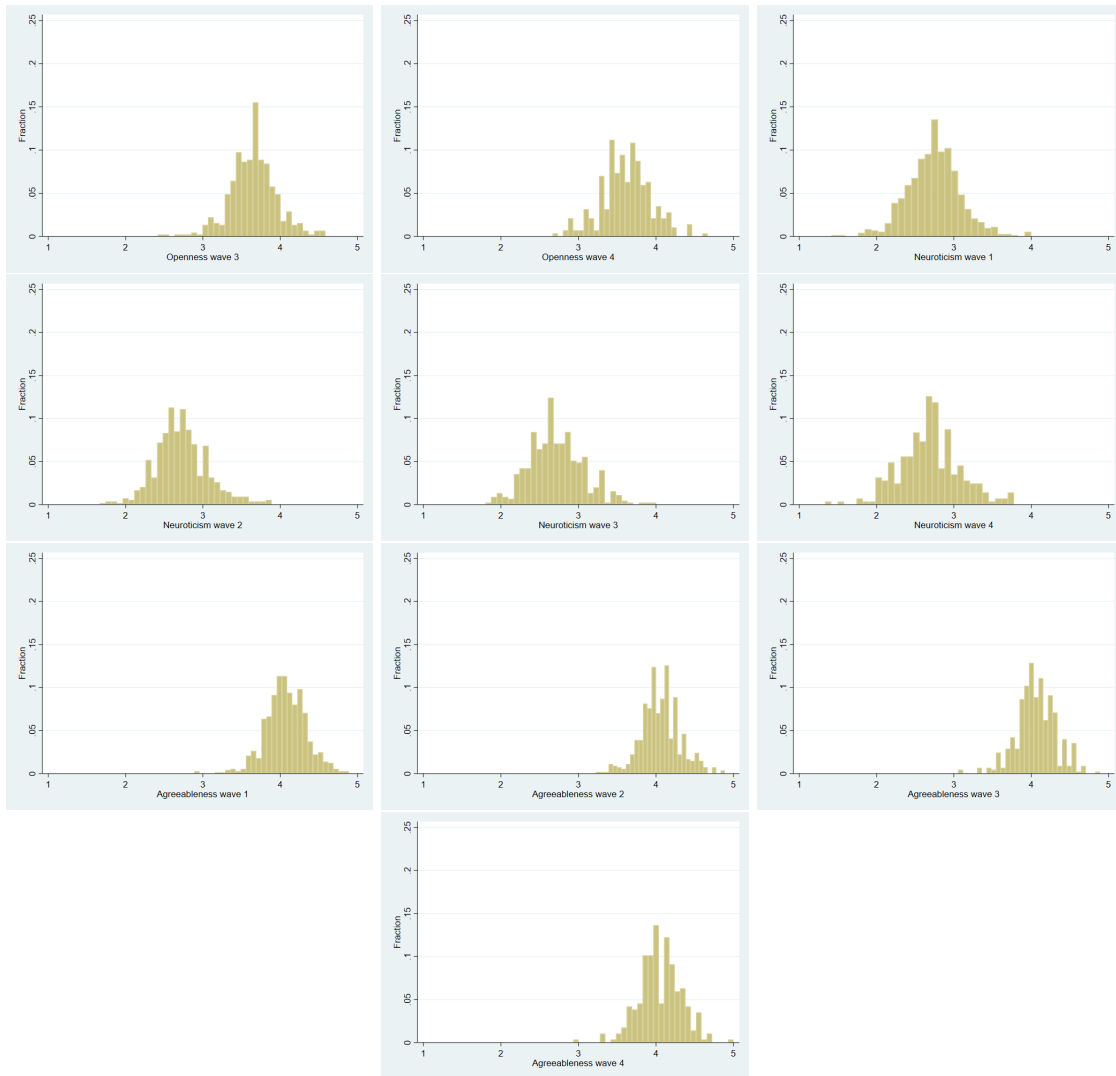


Figure A.8: Distribution of Big Five personality traits by wave. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave: 3 N=451, wave: 4 N=286. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave cell. Survey items shown in Table A.1.



Figure A.9: Firm-wave level averages of preferences in waves 1 to 4. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3: N=451, wave: 4 N=286, except positive reciprocity, negative reciprocity, and altruism (each wave 1: N=515, wave 2: N=541, wave 3: N=451, wave 4: N=286), and time preferences (in wave1 N=515, wave 2 N=541, in wave 3 N=450, in wave 4 N=286). 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.

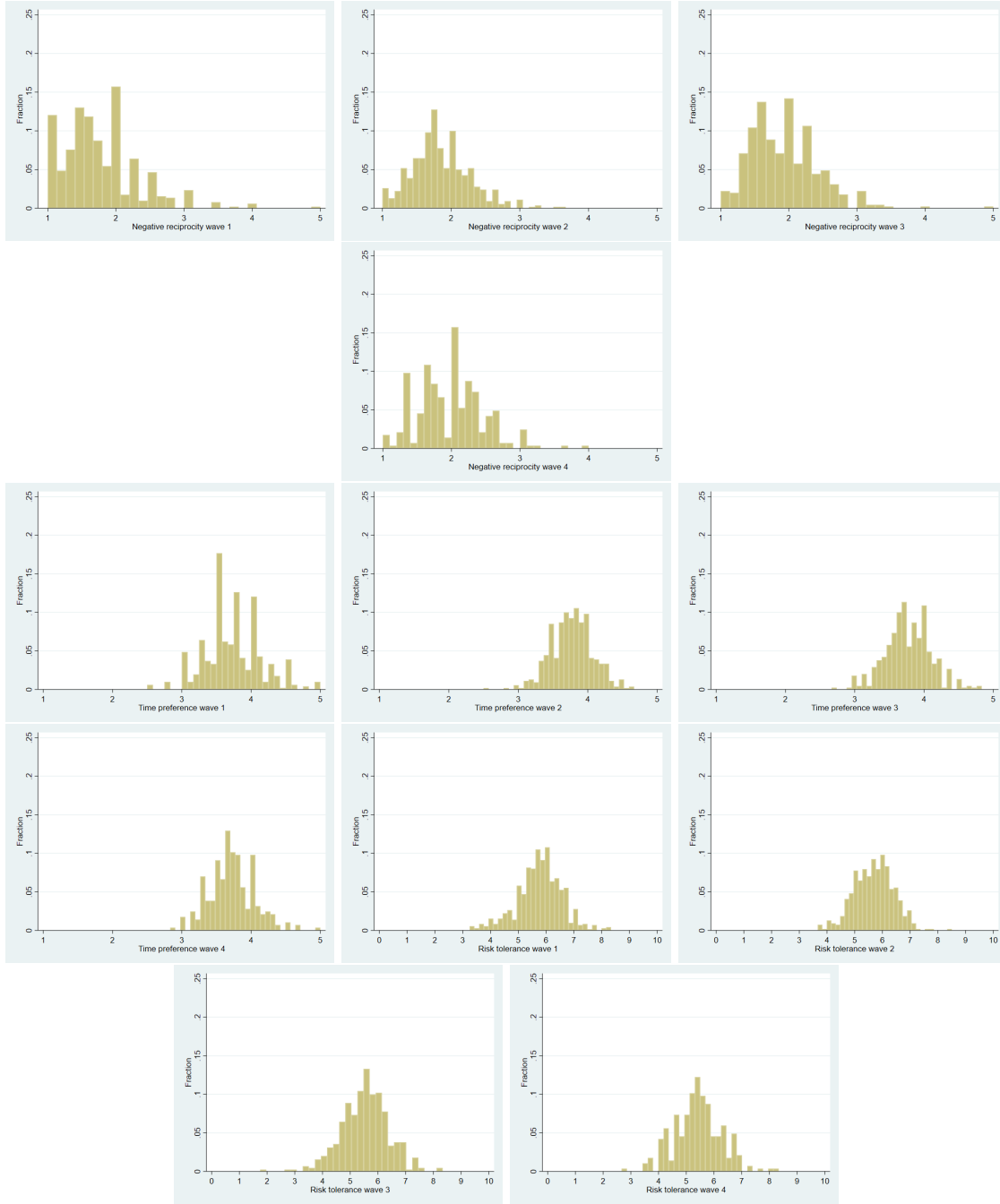


Figure A.10: Firm-wave level averages of preferences in waves 1 to 4. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3: N=451, wave 4: N=286, except positive reciprocity, negative reciprocity, and altruism (each wave 1: N=515, wave 2: N=541, wave 3: N=451, wave 4: N=286), and time preferences (wave 1: N=515, wave 2: N=541, wave 3: N=450, wave 4: N=286). 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.