

# Helping and Antisocial Behavior in the Workplace

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## Abstract

Using representative employer-employee panel data of German firms, we show that differences in supervisors' people skills, as well as workforce trust, 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 results corroborate the importance of both leadership and workforce composition with respect to preferences and personality for the manifestation of cooperative and non-cooperative workplace cultures.

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“Few things leaders can do are more important than encouraging helping behavior within their organizations.”

Amabile et al. (2014)

## 1 Introduction

If employees help each other, firms can benefit (Hamilton, Nickerson, and Owan, 2003; Grant, 2013). 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 differences between firms? Why do some firms benefit from a high willingness among employees to help each other while others do not, or even see high levels of antisocial behavior? Does “good” leadership and people management promote helping, and reduce antisocial behavior (Amabile, Fisher, and Pillemer, 2014; Kosfeld, 2020; Hoffman and Tadelis, 2021)? How important are employees’ personality traits (Almlund et al., 2011), and economic preferences (Becker et al., 2012), such as altruism and reciprocity (Kosfeld and von Siemens, 2011)? Using a unique data set spanning, on average, more than 1,000 German firms and 7,000 employees per wave, this paper offers a comprehensive analysis of the organizational and behavioral foundations of employee helping and antisocial behavior as an integral part of a firm’s workplace culture and working climate (Alan, Corekcioglu, and Sutter, 2021).

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.<sup>1</sup> First, our data contain explicit information from employees about mutual helping, as well as antisocial behavior in their firm. This allows us to construct reliable proxies 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 general trust, and economic preferences (in particular social preferences, but also risk attitude and time discounting). Together, these measures 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. On the one hand, leadership quality is elicited in every

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<sup>1</sup>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 consist of several establishments. For simplicity and whenever there is no possibility of confusion, we use the terms “firm” and “establishment” interchangeably.

survey wave, because leaders may rotate between teams and might develop and adjust their leadership skills over time. As a result, employees 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 can be considered as rather stable within individuals (Cobb-Clark and Schurer, 2012; Schwaba and Bleidorn, 2018; Fitzenberger et al., 2021). Hence, this information is elicited only once 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., are predictive for economically relevant behavior both at the individual and organizational level (cf. Falk et al. (forthcoming, 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 organizational 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 6,500-7,500 employees participating in each wave. 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. From this, a random sample of employees working within the surveyed establishments are interviewed outside their workplace, typically at home in the evening. Considering helping and antisocial behavior to be fundamental expressions of a firm’s workplace culture, 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, and employees in the modal firm report helping to take place at least “often”. In contrast, the distribution of antisocial behavior is right-skewed with a modal value between “never or nearly never” and “seldom”. As one might expect, helping and antisocial behavior are negatively correlated; but the size of the correlation on the firm level is actually rather 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. This suggests that helping and antisocial behavior are rather distinct forms of workplace behavior, and one is not just the absence of the other.

The next question is, what explains these firm-level differences? Our first finding shows that leadership plays a major role. Based on our preferred specification, a one SD increase in leadership quality is significantly associated with a 0.17 SD increase in helping and a 0.41 SD reduction in

antisocial behavior, respectively.<sup>2</sup> As our leadership measure varies over time, we can include firm fixed-effects, to test whether leadership drives within-firm changes in the outcomes. Our results remain quantitatively very similar. Hence, leadership explains helping across firms, and within firms. Next, employees' time-constant general trust is an almost similarly strong and significant predictor of both helping and antisocial behavior across firms, with a one SD higher level of general trust being associated with a 0.14 SD increase and a 0.13 SD decrease in helping and antisocial behavior, respectively. Intriguingly, the association of time-constant Big Five personality traits and social preferences is outcome-specific. In a nutshell: social preferences matter for helping, while personality predicts antisocial behavior. Precisely, our results show that a one SD increase in firm-level altruism or positive reciprocity is significantly associated with a 0.06 SD higher level of helping. At the same time the correlations between helping and personality traits are not robust across specifications. The opposite is true for antisocial behavior. Here, personality traits, in particular neuroticism, are significantly correlated and the correlation is robust across specifications. A one SD increase in firm-level neuroticism is associated with a 0.10 SD increase in antisocial behavior. Social preferences, on the other hand, are not significantly correlated with antisocial behavior.

Our results connect and add to several important strands of literature. With respect to workplace interaction, a number of recent papers have emphasized the importance of “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 subordinate-ratings of “people management skills” experience less subordinate turnover. Further, highly rated managers are rewarded with 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 a positive effect on team performance. Our measure of leadership quality, 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 variation in good people management significantly contributes to explaining firm-level differences in employees’ helping and antisocial behavior in the workplace.<sup>3</sup>

Next, with respect to the role of employees’ personality, seminal research by Heckman, Stixrud, and Urzua (2006), Borghans et al. (2008), and Almlund et al. (2011) has shown that differences

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<sup>2</sup>The comparably stronger association of leadership with antisocial behavior is probably at least partly due to superiors being explicitly mentioned as a potential source of antisocial behavior in the respective survey item. See details below.

<sup>3</sup>Dur, Kvaløy, and Schöttner (2021) provide a recent theoretical analysis of leadership styles showing that, perhaps somewhat counterintuitively, “unfriendly” leadership may also be an optimal outcome from the firm’s perspective.

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 antisocial behavior between firms can 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 somewhat corroborate this view, by showing that personality traits and preferences function differently in explaining helping and antisocial behavior. For example, our results show that general trust and social preferences significantly explain helping, while personality traits are not correlated with this behavior in a robust way. At the same time, personality (neuroticism) explains antisocial behavior, whereas social 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.<sup>4</sup>

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.<sup>5</sup> 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 Schwierén, 2020; Delfgaauw et al., 2022) or documenting differences in helping

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<sup>4</sup>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.

<sup>5</sup>More recent work includes Dur and Sol (2010) and Ishihara (2017).

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 possible drivers of helping and antisocial behavior in the workplace, based on a representative sample of firms from a large economy that includes rich information on key firm- and employee-level variables. Besides employee incentives, our data contain reliable information about employees’ “cooperative attitudes”, i.e., social preferences, enabling us to address theoretical predictions of Lazear (1989), Kandel and Lazear (1992), and Kosfeld and von Siemens (2009, 2011).

The remainder of this article 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. We also present several robustness tests. 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 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).<sup>6</sup> The LPP links important variables on the establishment level with rich employee-level information on 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 sampling approach was used, where establishments were randomly drawn from a matrix stratified by business sector, establishment size, and region.<sup>7</sup> 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

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<sup>6</sup>Besides 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.

<sup>7</sup>Details on the sampling matrices are provided in Bellmann et al. (2015).

establishments that had been interviewed in the initial 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 the survey being dominated by a few large establishments, larger establishments had smaller sampling probabilities. Importantly, the random sampling of employees based on administrative social security data mitigates possible selection effects often found in survey data research. In each wave, between 6,500 and 7,500 individuals, aged between 18 and 74, were 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. Further, 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. On average, 39% 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 items 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 Employee survey measures**

Our employee 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; Becker et al., 2012; Falk et al., forthcoming, 2018). In the following, we describe these measures in detail, and document their source. Note that in our empirical analysis, we aggregate all individual-level

variables on the establishment(-wave) level, as described below.

### 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 receiving help 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 response categories ranging from “never or nearly never”, “seldom”, “sometimes”, “often”, to “always”. Helping and antisocial behavior are asked repeatedly over the waves of the LPP. All variables are standardized with zero mean and unit variance prior to entering the regressions.

A first analysis at the individual level shows that the two helping items are strongly and positively correlated. The Spearman correlation coefficient between help offered and help received 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. Further, 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, responses fall in the two uppermost categories “often” and “always” 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 somewhat different dimensions of interpersonal behavior at the workplace. As we will further see below, they are not direct mirrors of one another.

### 2.2.2 Leadership quality

Employees’ assessment of leaders’ quality in people management in their establishment is 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*, 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).

Next, we apply a set of survey measures of economic preferences that have been behaviorally validated for Germany both in the lab and in the field (Becker et al., 2012; Falk et al., forthcoming), i.e., that have been shown to correlate significantly with behavior in corresponding experimental games and relevant outside-lab contexts. Precisely, we elicit *positive reciprocity* and *negative reciprocity* by two items from the Preference Survey Module (PSM) of Falk et al. (forthcoming), with one item also used in the SOEP. *Altruism* is similarly elicited by a single item from the PSM. Finally, we measure *trust* by two of the three items that are commonly used in the SOEP (Dohmen et al., 2008; Naef and Schupp, 2009).

As personality traits and preferences are considered to be rather stable for working-age adults (Cobb-Clark and Schurer, 2012; Schwaba and Bleidorn, 2018; Fitzenberger et al., 2021), they are asked only once when an employee is surveyed for the first time. For the regression analyses, we impute these values into all subsequent waves where the same individual is observed.

## 2.3 Controls

We take into account a rich set of control variables that originate either from the employee or from the establishment survey. Note again that all employee-level variables are aggregated to the establishment level prior to our empirical analyses. 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 for 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).<sup>8</sup> The estimated fixed effects are imputed across all individual observations.

We next include information about an employee’s level of *education*. Precisely, we include 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 an employee’s *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., forthcoming). 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 an employee’s 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 the employee’s own task fulfillment. Finally, we include an *interview method* dummy (CATI vs. CAWI).

We also elicit the following control variables directly at the establishment level. Originating from the employer survey, these 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)<sup>9</sup>, as well as *ownership* type (family firm, management, investor or dispersed ownership, (partly) state-owned, and other).

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; Bender et al., 2018; Bloom et al., 2019). We include dummy variables for the existence of performance appraisal systems, written

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<sup>8</sup>Detailed information about the LPP-ADIAB is provided via DOI: 10.5164/IAB.FDZD.1907.en.v1.

<sup>9</sup>Some of the smallest establishments may shrink in size over time and are then allocated to the category “less than 50 employees”.

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 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. Further, 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.<sup>10</sup> Finally, we include survey-wave fixed effects.

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.

## 2.4 Hypotheses

How do we expect leadership quality, personality, social preferences, and general trust to be related to helping and antisocial behavior in the workplace?

With respect to leadership, Kosfeld (2020) shows that leader behavior based on trust and fairness induces prosocial behavior among followers. It may also signal that helping is profitable and an advantageous social norm (Hermalin, 1998; Potters, Sefton, and Vesterlund, 2007; Sliwka, 2007; Danilov and Sliwka, 2017). Further, leaders are often responsible for rewarding desirable and sanctioning undesirable behavior, thereby fostering prosocial and cooperative behavior and decreasing antisocial behavior (Kosfeld and Rustagi, 2015). We therefore predict a positive correlation between our leadership measure, which is based on supervisor trust, fairness, and understanding, and the level of helping in firms as well as a negative correlation between the leadership measure and the level of antisocial behavior.

Concerning the relationship between personality traits and helping, laboratory experiments by Kagel and McGee (2014) and Proto, Rustichini, and Sofianos (2019) show that agreeableness is associated with cooperative tendencies like helping. Extroverted employees are more communicative and sociable, 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

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<sup>10</sup>We 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.

concerned with envy, insecure, and generally worried with themselves; this likely reduces the willingness to engage in mutual helping with colleagues. We therefore predict that helping is positively correlated with agreeableness, openness, and extroversion, and negatively correlated with neuroticism. With respect to antisocial behavior, we expect less antisocial behavior among more agreeable employees. Further, neuroticism is a possible candidate to be positively correlated with antisocial behavior in a given firm, because it could easily be associated with misunderstandings and conflicts between employees.

Concerning helping and 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 by definition. Field studies indeed show that differences in prosocial preferences are significantly associated with cooperative behavior both on the individual, and the group level (Rustagi, Engel, and Kosfeld, 2010; Falk et al., 2018). Further, theory suggests that individuals may sort into different firms based on social preferences creating different organizational cultures of cooperation (Kosfeld and von Siemens, 2009, 2011). This is also corroborated by laboratory evidence (Gächter and Thöni, 2005; Brekke et al., 2011; Bauer, Kosfeld, and von Siemens, 2021). We hence predict a positive correlation between social preferences and helping, particularly for altruism and positive reciprocity. Altruism is also expected to correlate negatively with antisocial behavior, as the latter inflicts harm on others, which is valued negatively by altruistic individuals. Positive reciprocity, however, is less clear, because it characterizes behavior in response to others' kindness and not unkindness (like antisocial behavior), which negative reciprocity would do. Dohmen et al. (2009) show that positive and negative reciprocity are indeed only weakly correlated. Thus, we would expect negative, rather than positive, reciprocity to be correlated with antisocial behavior in the workplace.

Finally, with respect to the relationship between employees' level of general trust and helping in firms, the existing literature suggests that trust should be positively associated with cooperation in general, as well as in organizations (see La Porta et al. (1997) and the references therein). For example, trust is necessary to offer help 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 also differs from social preferences, because it additionally captures the belief about being able to rely on others (Fehr, 2009). Gächter et al. (2012) and Miettinen et al. (2020) show that beliefs about others' cooperation is indeed a positive predictor for one's own cooperation. We therefore expect a positive correlation between trust and helping. For antisocial behavior, the association is predicted to be negative, as 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.

### 3 Results

In our empirical analysis, we average all individual-level variables on the firm-level in each survey wave. Hence, our unit of observation is firm  $f$  in survey wave  $t$ . These equally-weighted firm-wave-averages are calculated for establishments with at least three observations per wave.<sup>11</sup> 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 a workplace-culture perspective on the manifestation and foundations of helping and antisocial behavior. Summary statistics of all (unstandardized) firm-wave average variables are provided in Table A.3 in the Appendix.

We first document the variation in helping and antisocial behavior across firms, based on our representative data (3.1). We then come to our main research question: What explains these firm-level differences in helping and antisocial behavior? In subsection 3.2, we present our empirical strategy, followed by the main results (3.3, 3.4) and additional robustness tests (3.5).

#### 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.<sup>12</sup>

Similar to our findings on the individual level (Section 2.2.1), the firm-level data confirm that helping and antisocial behavior are rather distinct concepts, and not just one the absence of the

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<sup>11</sup>The 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.

<sup>12</sup>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 between waves 1 and 2 ( $p < 0.00$ ), as well as between waves 3 and 4 ( $p < 0.00$ ). The difference in distributions between waves 2 and 3 is not statistically significant ( $p = 0.69$ ). 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 ( $p < 0.00$ ), but stays similar from waves 1 to 2 ( $p = 0.21$ ) and 2 to 3 ( $p = 0.32$ ).

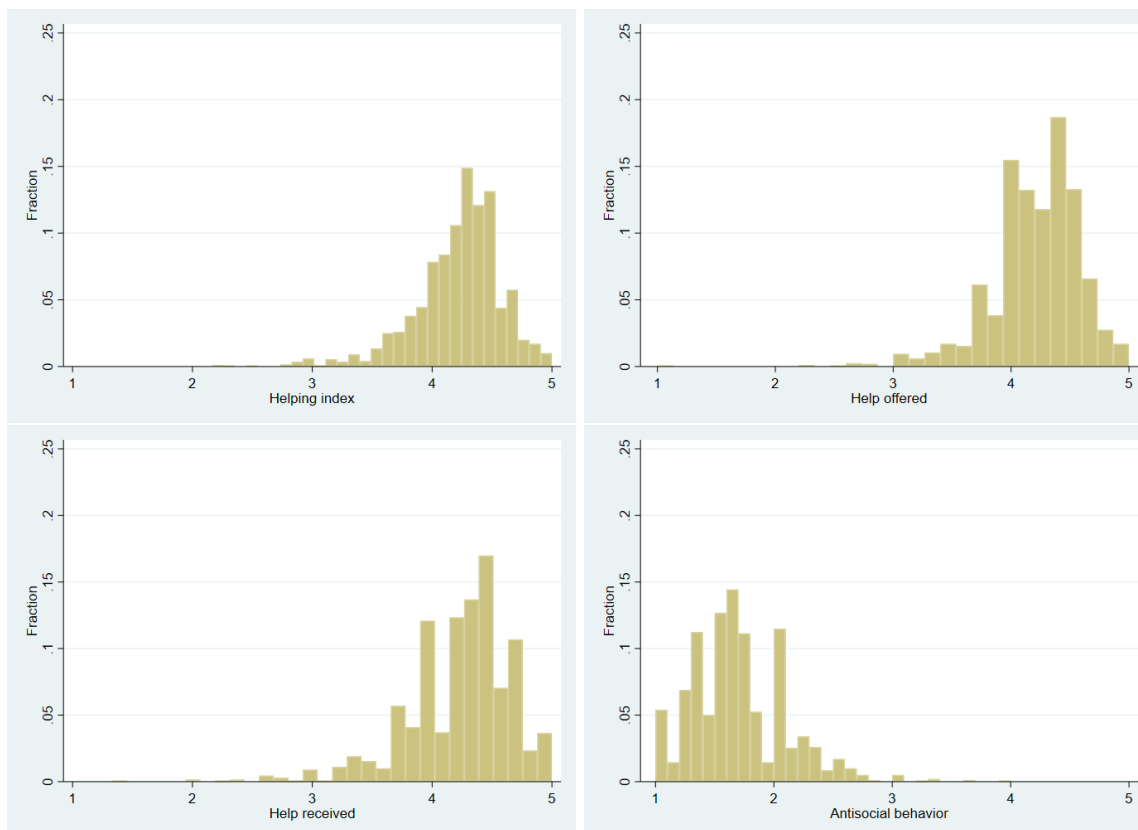


Figure 1: Distribution of establishment-wave averages of the helping index, help offered, help received, and antisocial behavior. Source: Linked Personnel Panel, waves 1 to 4 (regression sample). Survey items are shown in Table A.1.  $N=2,002$  per histogram. Only establishments with at least three employee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

other. While both are significantly negatively correlated at the firm level, the correlation size is rather modest (Spearman  $\rho = -0.22$  across all waves,  $p < 0.00$ ). 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. 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  $p < 0.00$ ). 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).<sup>13</sup>

<sup>13</sup>We 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.6 in the Appendix.

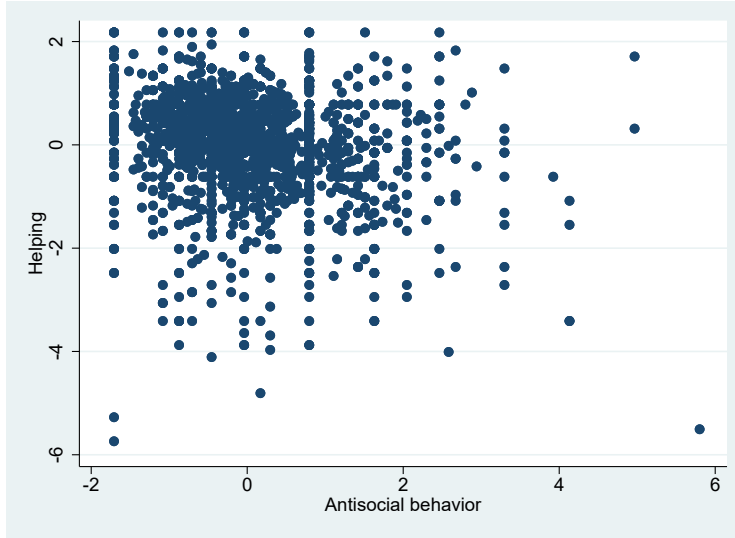


Figure 2: Scatter plot between helping index (std.) and antisocial behavior (std.) at the establishment-wave level. Source: Linked Personnel Panel, waves 1 to 4. N=2,002. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave 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-wave-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 group of regression equations:

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

The main independent firm-level variables ( $EXPLANATORY_{f,t}$ ) are either leadership quality ( $LEADERSHIP_{f,t}$ ), Big Five personality traits ( $PERSONALITY_{f,t}$ ), or social 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 ( $\theta_t$ ).

We next simultaneously include all three groups of explanatory variables and estimate the following regression equation in the full model:

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

This allows us to check whether leadership, personality traits, economic preferences, and trust have distinct additional explanatory power. This is the main specification we refer to.

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. This allows for a different interpretation. While the LDV estimation is a robustness check of how helping varies across firms, the firm-fixed effects estimation shows how helping changes within firms, on average, if leadership changes. We cannot conduct analogous firm fixed-effects regressions to examine the explanatory power of personality traits, social preferences, and general trust, as these characteristics are considered as fixed within individuals and elicited only once per individual and imputed into future observations of the individual. Hence, any firm-level differences in this regard would require substantial changes in the workforce composition, which we do not observe.<sup>14</sup>

### 3.3 Helping

Table 1 contains our results for helping in the workplace as the dependent variable. We first study whether leadership quality positively correlates with helping across firms. The results reported in column (1) show that leadership quality is positively associated with subordinates' helping 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 magnitude remains at 76% of the coefficient without personality and preferences, suggesting a predominantly complementary relationship between explanatory variables in explaining across-firm differences.

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<sup>14</sup>For example, we observe 643 movers in our total sample, corresponding to only about 3% of employee observations.



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)	0.2028*** (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.			0.0568** (0.0227)	0.0538** (0.0227)	0.1054*** (0.0340)	
Negative recipr.			-0.0050 (0.0251)	0.0190 (0.0250)	0.0016 (0.0390)	
Altruism			0.0752*** (0.0255)	0.0581** (0.0244)	0.0892** (0.0383)	
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. Human resource management (HRM) practices include performance appraisal systems, performance pay variables, written target agreements, employee feedback talks, (career) development plans, annual employee surveys, consequence management, code of conduct, and the importance of a good working atmosphere for retaining employees. Employee- and establishment-level survey items are described in Section 2 and in Tables A.1 and A.2 in the Appendix. Standard errors clustered on the establishment level in parentheses. The symbols \*, \*\*, and \*\*\* represent significance levels of 10%, 5%, and 1%, respectively.

The LDV specification reported in column (5) of Table 1 shows that although slightly smaller (88% of coefficient size without LDV), the link between leadership quality and helping remains substantial, and significant. Finally, column (6) reports the results of our firm fixed-effects regression. The results in the table indicate that an average within-firm increase in leadership quality by one SD is associated with a 0.20 SD average increase in helping behavior. Our results, therefore, confirm the predicted positive correlation between good leadership and helping.

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 of 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. However, the relationship between personality traits and helping is not quite robust. The results reported in column (4) show that the correlation with neuroticism and openness is halved and no longer statistically significant if we include leadership quality, social preferences, and trust in the regression. The estimated coefficients for extroversion and agreeableness are smaller, although still positively and significantly correlated. Further including the lagged dependent variable, the findings reported in column (5) reveal that extroversion 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. We, therefore, find only weak support for the predicted relationships between helping and personality traits.

What might explain that extroversion 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 partially explains why the correlation between agreeableness and helping is no longer significant. But this cannot be the entire story, because also the magnitudes (although not the sign) of the estimated coefficients change once we include the lagged dependent variable. It seems 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 extroversion.<sup>15</sup> 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, particularly for trust, 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 0.06 SD increase in helping, and a one SD increase in altruism is associated with a 0.08 SD increase in helping. The results reported in columns (4) and (5) show that these associations remain robust when including leadership quality, personality traits, and the lagged dependent variable in the regressions. Our results confirm the predicted positive relationships between helping and social preferences and trust.

### 3.4 Antisocial behavior

Table 2 contains our results for antisocial behavior in the workplace as the dependent variable. We, again, first study whether leadership quality is related to antisocial behavior across 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 in a within-firm analysis. Our results confirm the predicted negative relationship between good leadership and antisocial behavior. 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.

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<sup>15</sup>Results available upon request.

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)	-0.4474*** (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.			-0.0017 (0.0238)	-0.0177 (0.0209)	-0.0359 (0.0319)	
Negative recipr.			0.0224 (0.0251)	0.0132 (0.0220)	0.0393 (0.0322)	
Altruism			-0.0296 (0.0260)	-0.0134 (0.0219)	0.0151 (0.0338)	
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. Human resource management (HRM) practices include performance appraisal systems, performance pay variables, written target agreements, employee feedback talks, (career) development plans, annual employee surveys, consequence management, code of conduct, and the importance of a good working atmosphere for retaining employees. Employee- and establishment-level survey items are described in Section 2 and in Tables A.1 and A.2 in the Appendix. Standard errors clustered on the establishment level in parentheses. The symbols \*, \*\*, and \*\*\* represent significance levels of 10%, 5%, and 1%, respectively.

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. Further, a one SD higher level of neuroticism is associated with a 0.16 SD higher level of antisocial behavior. 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, therefore, find strong evidence only for the predicted negative relationship between neuroticism and antisocial behavior.

We finally consider the link between antisocial behavior and social preferences, as well as trust. Social preferences are related differently to antisocial behavior than to helping. The results reported in column (3), show 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. 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. The relationship does decrease in magnitude, suggesting that leadership and neuroticism, and trust are partly complementary when explaining antisocial behavior, and to some degree, substitutes. This could be due to supervisor's trust both being a part of the leadership index, and supervisors being possible perpetrators of antisocial behavior. Nevertheless, a substantial coefficient size (about 50%) remains in column (4), suggesting that general trust plays a role. Hence, the trust between employees of the same and lower rank, and other ranks than their direct supervisor is also important for mitigating antisocial behavior in firms.

### 3.5 Additional robustness tests

We conduct some additional robustness tests (see Section A.3 of the Appendix): exclusion of employee sample refreshers, restriction to a balanced panel of firms, and separation of the helping index.

First, to check whether our results are driven by the refreshment sample that addresses survey attrition, we exclude employee sample refreshers from the analysis. This tests whether results are potentially driven by unobserved differences in characteristics of refreshers and original survey respondents. As Table A.11 shows, the results are very similar to our baseline specification, although trust does lose significance in column (5), the lagged dependent variable specification.

Next, we use a balanced panel of firms to address a potential selectivity bias at the firm level. Here, we only keep firms in the data set that have been continuously surveyed in all four waves of the LPP. The balanced panel has the benefit of checking whether any developments that we observe over time are driven by a different composition of firms in the sample. The refreshment sample of firms used to construct the full sample aims to re-balance the initial sample, with respect to observable firm characteristics. It could be that for variables not considered in re-balancing, e.g., the establishment age, our results are driven by changes in the composition of firms with respect to these variables. Doing this exercise, we get an idea about the magnitude of the effect. Of course, this also introduces a survivor bias as the sample of surviving firms is no longer representative. As Table A.9 shows, positive reciprocity loses significance and reduces in size, but other coefficients remain similar in size in most specifications. Additionally, agreeableness stays significant across all specifications and large in size. Altruism loses significance in column (5), but stays relatively similar in size.

In Tables A.7 and A.8, we separate the helping index into its two survey items used to measure *help given* and *help received*. The results are nearly identical for both items, which again justifies their aggregation and shows that no single item drives our main results.

The robustness tests provide similar results for antisocial behavior. In Table A.12, where we exclude employee sample refreshers from the analysis, coefficients of neuroticism, trust and leadership are all significant and similar in magnitude. When using a balanced panel of firms in Table A.10, coefficient sizes and significance levels for neuroticism, trust, and leadership remain largely unchanged.

## 4 Conclusion

This paper uses a unique linked employer-employee data set to analyze the heterogeneity and foundations 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 economic 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 important 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 organizational and behavioral foundations of helping and antisocial behavior in the workplace.

Our results document considerable heterogeneity in helping and antisocial behavior across firms. Although the two behaviors are negatively correlated, a non-negligible share of firms exhibit both high levels of helping and antisocial behavior, suggesting that these are distinct dimensions of workplace cultures. With respect to foundations, we find that altruism and positive reciprocity significantly contribute to explaining the observed variation in helping. Personality traits (in particular, neuroticism) matter more for antisocial behavior. Employees' general trust is an important predictor for both outcome variables. In addition, leadership quality adds significant explanatory power and is strongly associated with more helping and in particular less antisocial behavior in the workplace.

Summarizing, we provide the first representative evidence that personality traits, preferences, trust, and leadership quality are essential explanations for 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 <sub>2010–2017</sub>	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

<b>Helping</b>				
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
<b>Antisocial behavior</b>				
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

Analytically weighted summary statistics of firm-wave averages 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

<b>Helping</b>				
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
<b>Antisocial behavior</b>				
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

Analytically weighted averages of firm-wave 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.2 Distribution of main variables

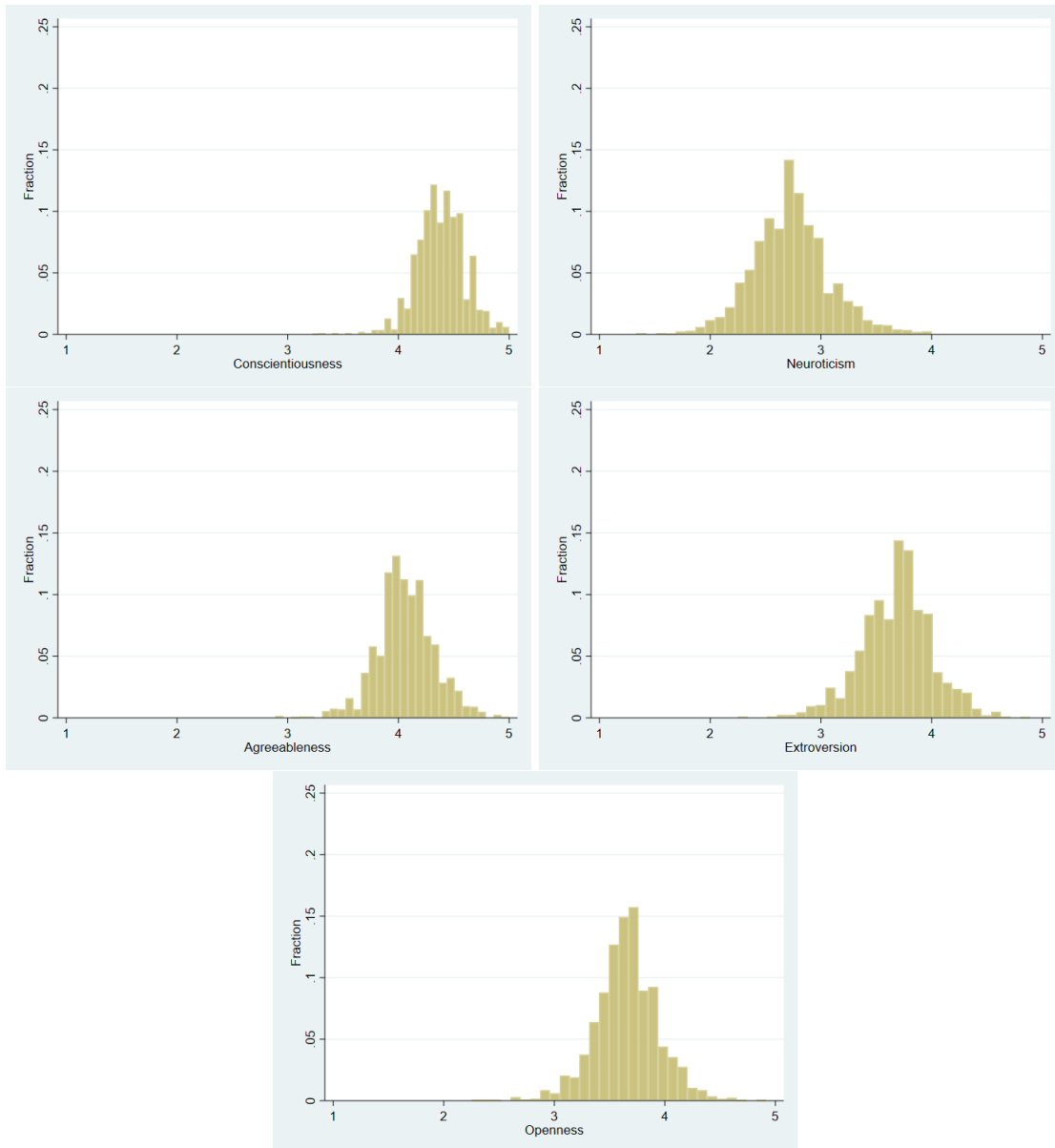


Figure A.1: Distribution of Big Five personality traits. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3: N=451, wave 4: N=286. Only establishments with at least 3 employee respondents used. One observation is the average response within one establishment-wave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

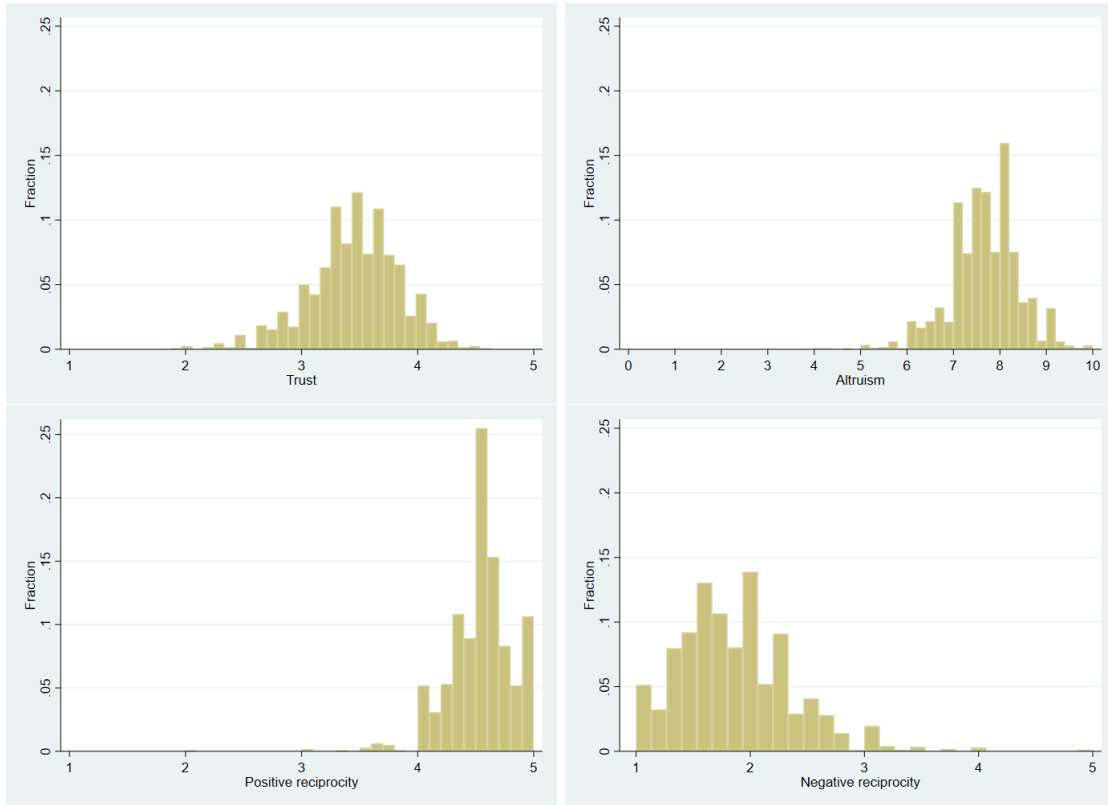


Figure A.2: Firm-wave level averages of trust and social preferences in waves 1 to 4. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3: N=451, wave 4 N=286, except positive reciprocity, negative reciprocity, and altruism (each wave 1: N=515, wave 2: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

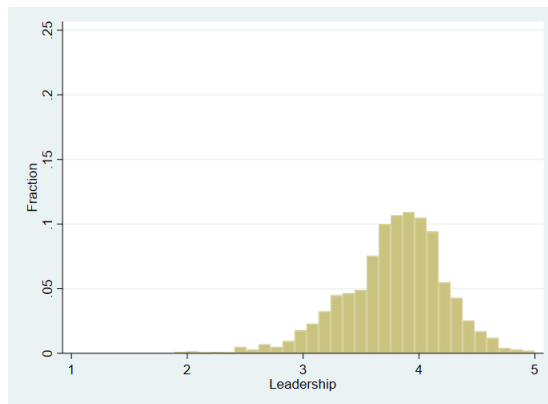


Figure A.3: Distribution of establishment-level averages of the leadership index. The leadership index is the equally weighted average of three items, supervisor trust, supervisor understanding and supervisor fairness. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave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

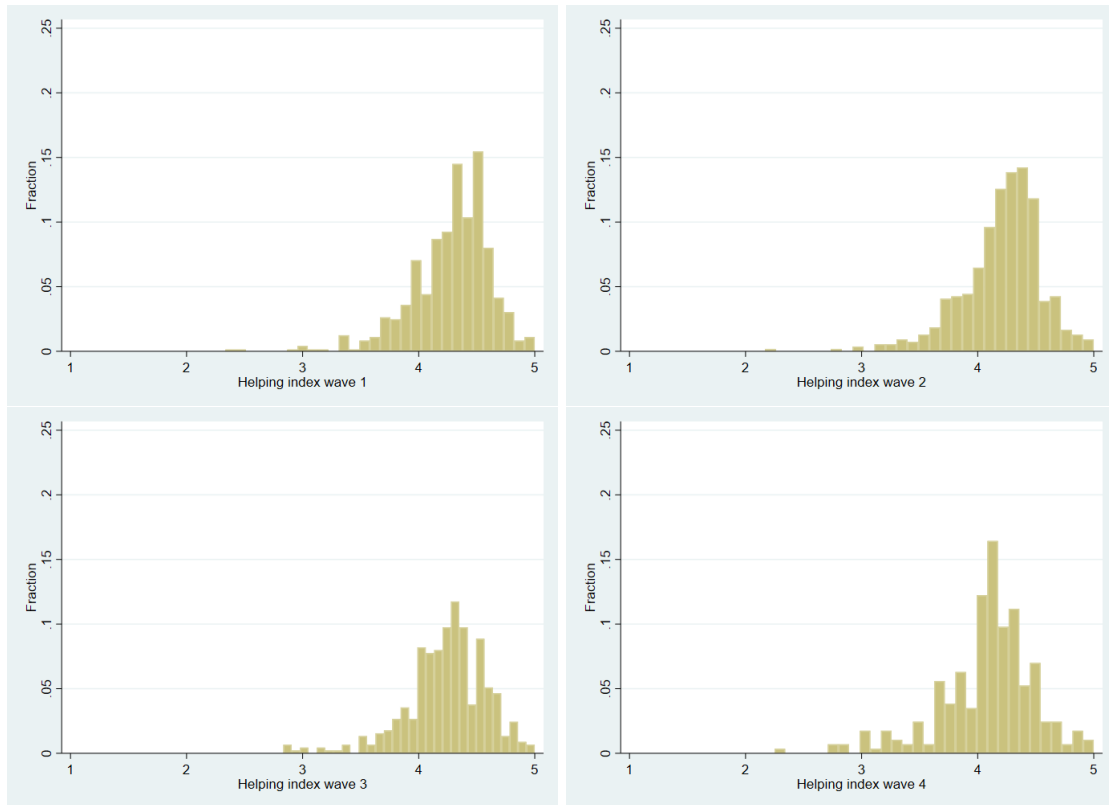


Figure A.4: Distribution of the establishment-wave average helping index by wave. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave 3 N=451, wave 4 N=286. Only establishments with at least 3 employee respondents per wave used. One observation is the average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

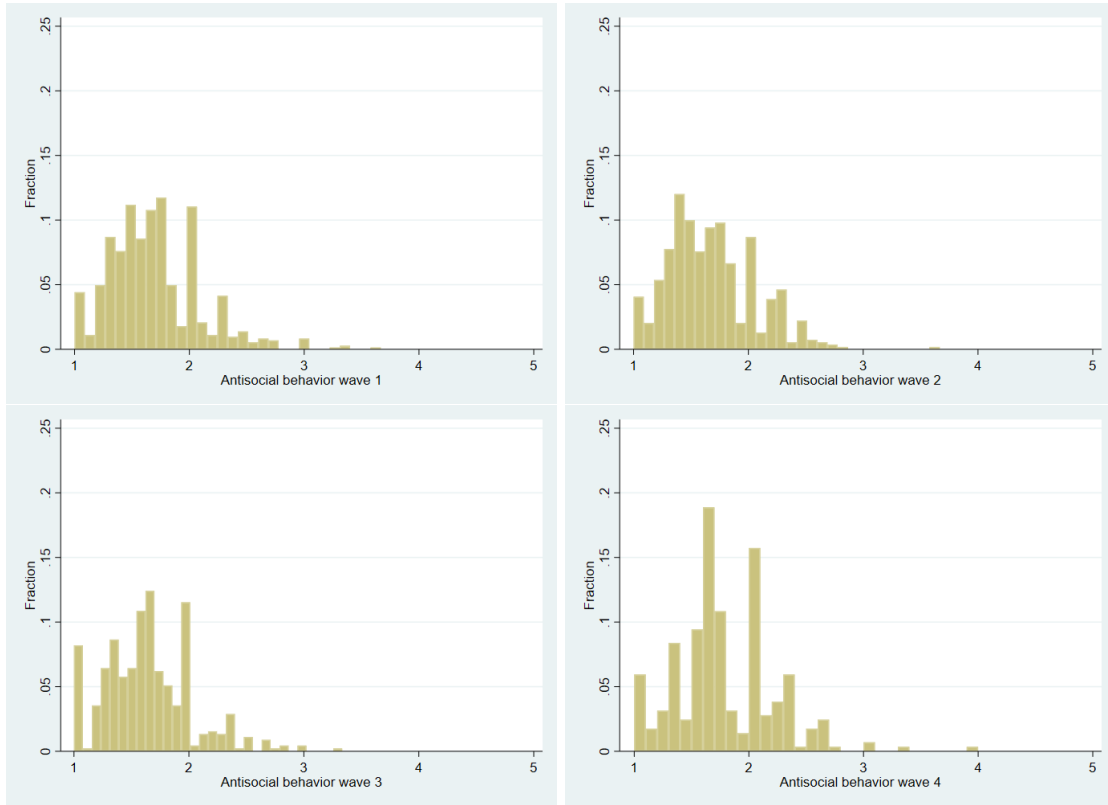


Figure A.5: Distribution of antisocial behavior of establishments by wave. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. In wave1 N=724, wave 2 N=541, in wave 3 N=451, in wave 4 N=286. Only establishments with at least 3 employee respondents per wave used. One observation is the average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

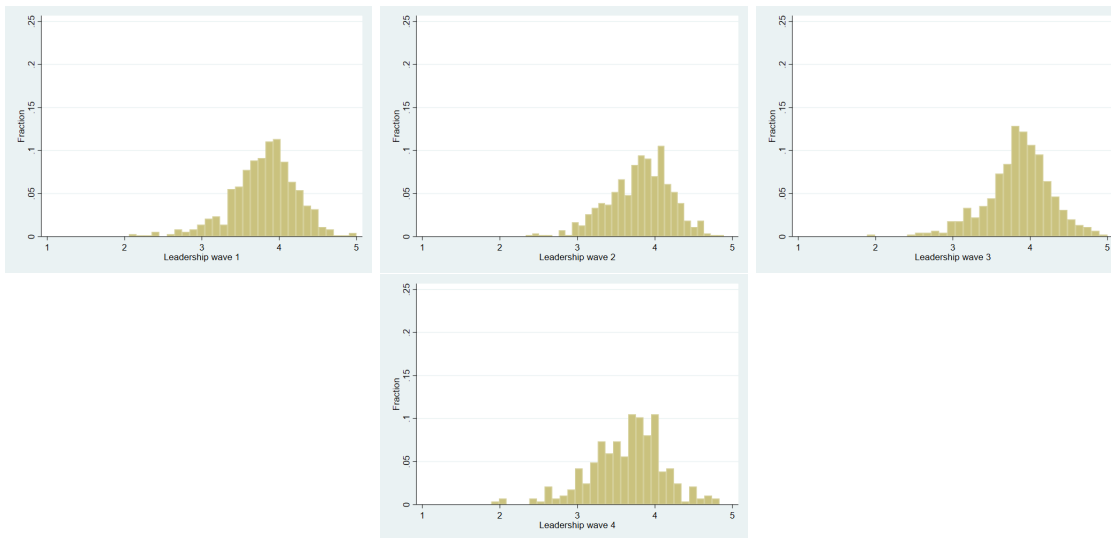


Figure A.6: Distribution of the leadership index by wave. Source: Linked Personnel Panel, waves 1 to 4. N=2,002 in total. Wave 1: N=724, wave 2: N=541, wave: 3 N=451, wave: 4 N=286. Only establishments with at least 3 employee respondents per wave used. One observation is the average response within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



## A.3 Additional robustness tests

### A.3.1 Individual helping items

Table A.7: Determinants of help given

Dep. variable:	Help given (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Leadership	0.1186*** (0.0237)			0.0771*** (0.0238)	0.0609* (0.0349)	0.1121* (0.0577)
Conscientiousness		0.0652** (0.0263)		0.0704*** (0.0264)	0.0946** (0.0371)	
Extroversion		0.0628** (0.0255)		0.0530** (0.0256)	0.0254 (0.0336)	
Neuroticism		-0.0360 (0.0257)		-0.0237 (0.0262)	-0.0564 (0.0351)	
Openness		0.0764*** (0.0270)		0.0614** (0.0266)	0.0439 (0.0379)	
Agreeableness		0.0810*** (0.0267)		0.0599** (0.0272)	0.0128 (0.0394)	
Trust			0.1056*** (0.0285)	0.0753*** (0.0287)	0.0746* (0.0423)	
Positive recipr.			0.0695*** (0.0238)	0.0602** (0.0235)	0.1083*** (0.0355)	
Negative recipr.			-0.0073 (0.0243)	0.0186 (0.0245)	0.0087 (0.0386)	
Altruism			0.0711*** (0.0259)	0.0558** (0.0254)	0.0918** (0.0390)	
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	0.14	0.16	0.15	0.17	0.20	0.31
Obs.	2,002	2,002	2,002	2,002	973	2,002

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 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. Standard errors clustered on the establishment level in parentheses. The symbols \*, \*\*, and \*\*\* represent significance levels of 10%, 5%, and 1%, respectively.

Table A.8: Determinants of help received

Dep. variable:	Help received (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Leadership	0.2624*** (0.0231)			0.2108*** (0.0234)	0.1916*** (0.0344)	0.2393*** (0.0527)
Conscientiousness		-0.0305 (0.0258)		-0.0175 (0.0249)	0.0300 (0.0361)	
Extroversion		0.0541** (0.0260)		0.0385 (0.0252)	0.0246 (0.0373)	
Neuroticism		-0.0757*** (0.0254)		-0.0334 (0.0251)	-0.0067 (0.0332)	
Openness		0.0154 (0.0276)		-0.0103 (0.0261)	-0.0311 (0.0375)	
Agreeableness		0.1271*** (0.0261)		0.0822*** (0.0251)	0.0601* (0.0348)	
Trust			0.2295*** (0.0290)	0.1614*** (0.0292)	0.1346*** (0.0405)	
Positive recipr.			0.0336 (0.0230)	0.0368 (0.0232)	0.0812** (0.0341)	
Negative recipr.			-0.0028 (0.0257)	0.0145 (0.0255)	-0.0051 (0.0379)	
Altruism			0.0627** (0.0248)	0.0477** (0.0236)	0.0703* (0.0367)	
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	0.15	0.18	0.22	0.28	0.36
Obs.	2,002	2,002	2,002	2,002	973	2,002

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 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. Standard errors clustered on the establishment level in parentheses. The symbols \*, \*\*, and \*\*\* represent significance levels of 10%, 5%, and 1%, respectively.

### A.3.2 Balanced panel of firms

Table A.9: Determinants of mutual helping

Dep. variable:	Helping index (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Leadership	0.2166*** (0.0345)			0.1429*** (0.0362)	0.1282*** (0.0416)	0.2230*** (0.0570)
Conscientiousness		0.0271 (0.0381)		0.0565 (0.0362)	0.1012** (0.0434)	
Extroversion		0.0760** (0.0353)		0.0544 (0.0343)	0.0305 (0.0378)	
Neuroticism		-0.0461 (0.0348)		-0.0104 (0.0349)	0.0187 (0.0385)	
Openness		0.0338 (0.0414)		0.0098 (0.0401)	0.0059 (0.0470)	
Agreeableness		0.1608*** (0.0382)		0.1215*** (0.0364)	0.1097*** (0.0420)	
Trust			0.2197*** (0.0390)	0.1592*** (0.0388)	0.1228*** (0.0438)	
Positive recipr.			-0.0069 (0.0323)	-0.0040 (0.0315)	0.0563 (0.0438)	
Negative recipr.			-0.0122 (0.0334)	0.0351 (0.0326)	0.0743 (0.0454)	
Altruism			0.0986*** (0.0356)	0.0807** (0.0348)	0.0653 (0.0459)	
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	0.26	0.26	0.26	0.30	0.34	0.45
Obs.	924	924	924	924	623	924

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 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. 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.10: Determinants of antisocial behavior

Dep. variable:	Antisocial behavior (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Leadership	-0.4733*** (0.0311)			-0.4067*** (0.0305)	-0.3762*** (0.0356)	-0.4569*** (0.0555)
Conscientiousness		0.0788** (0.0396)		0.0567 (0.0358)	0.0790* (0.0458)	
Extroversion		-0.0933** (0.0367)		-0.0504 (0.0324)	-0.0270 (0.0381)	
Neuroticism		0.2256*** (0.0373)		0.1609*** (0.0353)	0.1961*** (0.0400)	
Openness		-0.0047 (0.0417)		0.0318 (0.0355)	0.0279 (0.0444)	
Agreeableness		-0.1304*** (0.0385)		-0.0569 (0.0364)	-0.0434 (0.0416)	
Trust			-0.3059*** (0.0391)	-0.1333*** (0.0360)	-0.1247*** (0.0480)	
Positive recipr.			-0.0010 (0.0369)	-0.0412 (0.0326)	-0.0330 (0.0453)	
Negative recipr.			0.0441 (0.0380)	0.0219 (0.0333)	0.0788* (0.0440)	
Altruism			-0.0314 (0.0345)	-0.0061 (0.0325)	0.0747 (0.0467)	
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	0.30	0.18	0.18	0.35	0.37	0.44
Obs.	924	924	924	924	623	924

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 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. 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.3.3 Excluding sample refreshers

Table A.11: Determinants of mutual helping

Dep. variable:	Helping index (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Leadership	0.2197*** (0.0294)			0.1703*** (0.0304)	0.1452*** (0.0419)	0.2003*** (0.0660)
Conscientiousness		-0.0336 (0.0311)		-0.0108 (0.0303)	0.0051 (0.0387)	
Extroversion		0.0491 (0.0334)		0.0289 (0.0330)	-0.0018 (0.0393)	
Neuroticism		-0.0584** (0.0291)		-0.0218 (0.0293)	-0.0223 (0.0345)	
Openness		0.0519 (0.0374)		0.0239 (0.0354)	0.0170 (0.0447)	
Agreeableness		0.1465*** (0.0327)		0.1133*** (0.0322)	0.1231*** (0.0387)	
Trust			0.1705*** (0.0334)	0.1087*** (0.0330)	0.0567 (0.0361)	
Positive recipr.			0.0590* (0.0308)	0.0673** (0.0290)	0.1189*** (0.0423)	
Negative recipr.			-0.0102 (0.0295)	0.0162 (0.0298)	0.0186 (0.0406)	
Altruism			0.1291*** (0.0285)	0.1041*** (0.0274)	0.1494*** (0.0364)	
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	0.15	0.15	0.16	0.20	0.24	0.24
Obs.	1,703	1,703	1,703	1,703	877	1,703

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 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. 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.12: Determinants of antisocial behavior

Dep. variable:	Antisocial behavior (std.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Leadership	-0.3928*** (0.0286)			-0.3429*** (0.0276)	-0.3017*** (0.0344)	-0.3226*** (0.0562)
Conscientiousness		0.0056 (0.0341)		-0.0219 (0.0312)	-0.0112 (0.0405)	
Extroversion		-0.0695** (0.0302)		-0.0377 (0.0282)	-0.0234 (0.0362)	
Neuroticism		0.1969*** (0.0339)		0.1310*** (0.0310)	0.1439*** (0.0368)	
Openness		0.0025 (0.0313)		0.0290 (0.0287)	0.0317 (0.0376)	
Agreeableness		-0.0727** (0.0327)		-0.0307 (0.0326)	-0.0516 (0.0408)	
Trust			-0.2430*** (0.0351)	-0.1287*** (0.0312)	-0.1193*** (0.0421)	
Positive recipr.			-0.0207 (0.0275)	-0.0417 (0.0259)	-0.0556 (0.0353)	
Negative recipr.			0.0227 (0.0315)	0.0128 (0.0296)	0.0198 (0.0384)	
Altruism			-0.0271 (0.0300)	-0.0035 (0.0285)	0.0411 (0.0373)	
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	0.21	0.13	0.12	0.26	0.26	0.28
Obs.	1,703	1,703	1,703	1,703	877	1,703

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 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. 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.