Trade Union Membership and Life Satisfaction

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Abstract:

The effects of trade union membership on wages and job satisfaction have been studied extensively. Arguably, life satisfaction serves as a more comprehensive measure of the benefits of union membership and warrants closer examination. Using all relevant waves from the German Socio-Economic Panel between 1985 and 2019, we find a negative correlation between trade union membership and life satisfaction in OLS and FE specifications. The association may arise because union members are more concerned about their job and the economic situation and less satisfied with their work. Social capital and wages also perform as channels between membership and life satisfaction. The negative correlation is more pronounced in settings in which trade unions are relatively weak.

Keywords: German Socio-Economic Panel, Industrial Relations in Germany, Life Satisfaction, Trade Union Membership

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1 Introduction

Trade unions, like many other interest groups, aim to improve the well-being of their constituency. Since one of central objectives is to raise wages, the wage mark-up represents an important indicator of union success. While this wage gain for union members varies across countries and over time, it is mostly positive (Fang and Hartley, 2022) and often substantial enough to exceed the costs due to membership fees. The wage premium may, however, be an inadequate indicator of the well-being consequences of union membership. First, unions affect other working conditions. This impact could be positive if, for example, trade unions bargain for better safety standards. The effect could be negative if higher wages induce employers to reduce non-wage benefits, in order to slow down the increase in labour costs. Second, benefits associated with trade union membership, such as greater vacation entitlements or support in case of conflicts with the employer, may have non-monetary elements. Third, the gains from union membership may be distributed unevenly and non-monetary benefits may accrue to other members than to those who obtain the wage increases. Fourth, for the employees' decision whether to be a union member the subjective evaluation of the consequences of membership may be more relevant than objective indicators, such as higher wages or greater fringe benefits. Accordingly, analyses of the impact of trade unions on their members' well-being have frequently focused on job satisfaction (see, for example, the meta-analysis by Laroche (2016) and the surveys by Artz and Heywood (2021) and Goerke (2021)). However, as it is the case for the union wage mark-up, job satisfaction may also be an insufficient indicator of the entire well-being effects of union membership. First, work-related correlates of union membership can have broader satisfaction effects. Second, employees may trade off a lower utility from the job against a higher non-work utility resulting from union membership, or vice versa. Accordingly, investigating the life satisfaction effects of union membership can offer insights beyond those gained from examining wages or job satisfaction. Consequently, this paper explores the relationship between trade union membership and life satisfaction.

We focus on Germany, the largest economy in the European Union (EU), using data from all waves of the German Socio-Economic Panel (SOEP) between 1985 and 2019 that include information about a respondent's trade union membership. In Germany, union membership is not tied to a job and, therefore, distinct from coverage by a collective bargaining contract. While a collec-

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tive agreement binds the firms it covers and the members of the contracting trade union, covered employers usually apply agreements to the entire workforce, irrespective of an individual's union membership status. In consequence, many employees free-ride on the benefits of union-negotiated bargaining agreements. These features make the German case particularly interesting as the benefits of union membership and the well-being consequences are less obvious than in countries where membership and bargaining coverage are more closely aligned as, for example, in the United States.

As our first contribution, we document a robust negative correlation between trade union membership and life satisfaction for pooled cross-sectional data and when considering time-invariant unobservable individual characteristics. This finding is consistent with the results concerning job satisfaction for Germany, but is not in line with the scarce evidence on the life satisfaction effects of union membership for other countries.

Previous investigations have put forward several explanations for a positive correlation. If, for example, membership results in a wage differential, this can represent a channel by which membership contributes to life satisfaction. Empirically, the explanation can be assessed by comparing estimation results with and without wage information as a covariate. As our second contribution, we analyse various explanations for the observed negative correlation between union membership and life satisfaction. Our analysis suggests that union members are more concerned about job security and their own economic situation than comparable non-members. These complementary explanations can help to clarify why union members are less satisfied with their life. Moreover, these effects are not fully reflected in differential levels of job satisfaction, suggesting that life satisfaction may be a more comprehensive indicator of the well-being consequences of union membership. We, furthermore, find that union members earn higher wages and have greater social capital than non-members. Controlling for these two complementary aspects strengthens the negative correlation between union membership and life satisfaction. When accounting for all five explanations, we continue to observe a negative association, suggesting the need for further work on the causes of a negative correlation.

As our third contribution, we analyse the role of the two central pillars of industrial relations in Germany. The first pillar is collective bargaining. The second pillar is co-determination, particularly through works councils in the private sector and personnel councils in the public sector. Our findings suggest that the negative correlation between union membership and life satisfaction is much weaker

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or does not arise in surroundings where unions have a more significant impact on working conditions, that is, in co-determined firms or those covered by collective bargaining. Instead, it is observable primarily in settings where trade unions are relatively weak.

The further paper proceeds as follows: Section 2 provides some background information on the German labour market and the role of trade unions. Section 3 outlines the theoretical considerations, which constitute the basis for our analysis. Section 4 summarizes the previous literature. In Section 5, we introduce the data and describe the empirical model. Section 6 presents our findings, while Section 7 concludes the paper.

2 Institutional Background

In Germany, bargaining coverage in the private sector has declined to 50% in 2021, while it still hovers around 90% in the public domain. Roughly four out of five employees subject to a collective agreement are covered by one negotiated at the sectoral level, while the remaining 20% benefit from a contract signed by a single firm and a trade union (Ellguth and Kohaut, 2022). Moreover, there are substantial differences in coverage rates according to firm size. While about 80% of firms with more than 500 employees have signed a collective agreement or belong to an employer association that has done so, this is true for only 2 out 3 firms with 200 to 500 employees and less than 50% with 50 to 199 staff members (Ellguth and Kohaut, 2022). Firms not subject to collective agreements can negotiate wages and working conditions individually with their staff. In about 50% of the relevant contracts, at least pay is aligned to a collective agreement (Hohendanner and Kohaut, 2023).

Net union density equalled 16.3% in 2019. It has declined substantially over the last decades, from a peak of about 36% just after re-unification in 1990 (OECD and AIAS, 2021). Union density among males is about 50% higher than among females. Union members generally pay a (tax-deductible) membership fee of 1% of their gross wage. In exchange, trade unions, for example, provide them with strike pay and advice in case of employment-related conflicts. Furthermore, union members benefit from financial advantages, such as reduced insurance contribution rates or price reductions for some leisure activities. Additionally, there is evidence that union members are better protected against dismissals and able to utilise their vacation entitlements to a greater extent than non-members (Goerke and Pannenberg, 2011; Goerke et al., 2015).

One of the main benefits of union membership can be a wage premium. There is substantial evidence for the United States and other countries of such a premium of 10% or more (surveyed, for example, by Fang and Hartley (2022)). In contrast, most studies for Germany suggest the absence of wage differences between union members and non-members (see, for example, Schmidt and Zimmermann (1991), Fitzenberger et al. (1999), and Goerke and Pannenberg (2004)). Somewhat in contrast, Wagner (1991) reports a positive wage effect of union membership for blue-collar workers of about 4.5% and a negative one for white-collar employees of a comparable magnitude, using data for West Germany in 1985. More recently, Bonaccolto-Töpfer and Schnabel (2023) document a union membership wage premium of 2.5% for 2015 and 2019.

One reason for the absence of or a relatively small union membership wage effect is that membership is not tied to a job and, therefore, distinct from coverage by a collective bargaining contract. This can already be observed when comparing the bargaining coverage to union density. From a legal perspective, collective bargaining agreements apply to all firms covered by the contract and union members who work in the covered firm. Individuals in covered firms cannot be forced to join a trade union, or to support unions financially. According to Hirsch et al. (2022), more than 90% of employees working in firms covered by a collective bargaining agreement are actually paid according to it. Due to data limitations, the study cannot relate the non-payment of collectively bargained wages to the union status of employees. Nonetheless, the substantial difference between bargaining coverage and union density implies that many employees free-ride on the benefits of union-negotiated bargaining agreements in Germany.[1]

While (sectoral) collective bargaining constitutes one of the main pillars of the German system of industrial relations, co-determination represents the second such cornerstone (Jäger et al., 2022a). Works councils can be established in private-sector firms with at least 5 employees. Works councils have information, consultation and co-determination rights. The latter are more extensive concerning personnel policy and social affairs and less pronounced regarding financial and economic aspects. Co-determination is no substitute but rather a complement to collective bargaining. Works councils are, for example, not allowed to negotiate wages if a collective bargaining determines them and they are forbidden to initiate a strike.

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[1] Addison et al. (2010), Gürtzgen (2009), and Hirsch and Mueller (2020) provide evidence for a positive wage effect of collective bargaining.

Since works councils are not compulsory, they exist in less than 10% of all eligible private-sector establishments. Personnel councils, the public-sector equivalent to works councils, have broadly the same rights and are much more widespread. As works councils are more likely to exist in large than in small establishments, about 40% of all private-sector employees are employed in firms with a works council.[2] In consequence, the two pillars of the industrial relations system co-exist especially in large establishments, and more than 80% of the employees in plants with a workforce of more than 500 individuals are covered by a collective bargaining agreement and simultaneously represented by a works council (Ellguth and Kohaut, 2022). Trade unions and works and personnel councils often closely cooperate and more than half of works council members actually belong to a trade union (Goerke and Pannenberg, 2024). However, councils and unions are distinct entities and, therefore, deserve separate consideration.

3 Theoretical Considerations

3.1 Individual Union Membership and Life Satisfaction

If the union membership decision is based on a rational choice, an employee will be a member if the resulting (expected) utility exceeds the (expected) utility from non-membership (Oswald, 1982; Booth, 1985; Booth and Chatterji, 1993; Barth et al., 2020). While utility is difficult to measure, there is extensive evidence on people's life satisfaction. If such satisfaction measure constitutes a suitable proxy for utility (see, inter alia, Blanchflower and Oswald (2004) and Rayo and Becker (2007)), we can expect life satisfaction to increase with trade union membership (see, e.g., Radcliff, 2005; Flavin et al., 2010; Keane et al., 2012; Flavin and Shufeldt, 2016).

Because union members and non-members can differ, for example, in demographic and job-related aspects, which, in turn, impact on life satisfaction, the expected correlation may not always be discernible in cross-sectional analyses. An empirical specification that accounts for time-invariant individual characteristics enables us to relate empirical results and theoretical predictions more closely. Therefore, it may be more likely that individual fixed effects (FE) specifications reveal a positive correlation between an individual's union membership and life satisfaction.

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[2]Additionally, there is co-determination at the level of the enterprise. It is compulsory in enterprises with at least 500 employees and grants the workforce representation on company boards. Its extent varies with firm size (Addison, 2009; Jäger et al., 2022a).

Empirical studies, while often implicitly or explicitly based on the above line of argument, have mostly looked at job satisfaction.[3] However, focussing on this linkage can neglect important determinants of well-being, which are not directly related to the job. If, for example, union membership provides individuals with valuable information about aspects not related to work, offers them the opportunity to purchase goods at reduced prices, or enables people to lead a socially more active life, this can result in an increase in life satisfaction without having an impact on the evaluation of the job. Moreover, even job-related aspects, such as job security, may affect job and life satisfaction differently if, for example, job-related uncertainty has an impact on the family. If, therefore, union membership involves benefits – or costs – not associated with or extending beyond the job, life satisfaction will be a strictly better proxy for the utility derived from being a union member than wages or job satisfaction. In addition, life satisfaction can reflect an individual's evaluation of the consequences of union membership, which is likely to be a more relevant determinant of behaviour than actual effects, such as the union wage mark-up.

3.2   Channels

In earlier contributions, various channels have been proposed through which union membership could positively affect life satisfaction.

First, union membership and life satisfaction may be correlated because of a union membership wage premium, which has been documented for many countries (see Bryson (2014) and Fang and Hartley (2022)). If wages have a positive impact on life satisfaction, union members will exhibit a higher level of satisfaction than non-members (Lee, 2022). For Germany, most studies find no evidence of a union membership wage premium, once observable characteristics are accounted for (Schmidt and Zimmermann, 1991; Fitzenberger et al., 1999; Goerke and Pannenberg, 2004; Bryson, 2014). Somewhat in contrast, Wagner (1991) reports a positive correlation between wages and union membership for blue-collar workers in West Germany, and Bonaccolto-Töpfer and Schnabel (2023) document a wage premium in recent years. In consequence, the wage channel either plays no role or could give rise to a positive, though not a negative, correlation between trade union membership

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[3]A search on EconLit illustrates this imbalance. Searching for the terms "*trade unions or labor unions or labour unions*" and "*job satisfaction*" yields 370 references, while replacing the second term by "*life satisfaction*" results in solely 13 hits (as per July 7, 2024). A comparable investigation using Google Scholar yields a much greater number of results and less pronounced asymmetry of 3:1 findings.

and life satisfaction in Germany.

Second, some contributions argue that union members have more intensive social interactions, greater social capital, and are more integrated into life (see, f.e., Radcliff (2005)). These expectations are often based on the assumption that unions organise meetings for their members, foster collaboration among colleagues, and help employees to cope with work-related stress.[4] Moreover, life satisfaction is positively associated with social capital (Helliwell and Putnam, 2004; Winkelmann, 2009). The above reasoning suggests that social capital contributes to a positive relationship between union membership and life satisfaction (Radcliff, 2005; Flavin et al., 2010; Keane et al., 2012; Flavin and Shufeldt, 2016).[5]

Third, it is often argued that union members are better protected against job losses (Freeman, 1980; Goerke and Pannenberg, 2011; Pierse and McHale, 2015; Berglund and Furåker, 2016; Ivlevs and Veliziotis, 2017) and, therefore, experience a higher level of job security than non-members. If subjectively perceived job security is a good proxy for its actual level and the perception has a positive impact on life satisfaction, as Clark et al. (2010) document, union members can be expected to exhibit higher life satisfaction than non-members through this channel (Radcliff, 2005; Flavin et al., 2010; Keane et al., 2012; Flavin and Shufeldt, 2016). The evidence for Canada and the United States is in conflict with the assumption that perceived job security of union members is higher than that of comparable non-members (Brochu and Zhou, 2009; Brochu and Morin, 2012). In the United Kingdom, the relationship varies across groups of workers and depends on tenure (Bender and Sloane, 1999). Moreover, union members' satisfaction with job security, which is probably highly correlated with perceived job security, may be lower than that of non-members (Bender and Sloane, 1998; Powdthavee, 2011; Green and Heywood, 2015; Bryson and White, 2016). For Germany, there is evidence of a positive impact of perceived job insecurity on union membership (Chadi and Goerke, 2023). In consequence, the direction of the relationship between trade union membership and life satisfaction due to job security considerations is difficult to predict.

Fourth, union membership may affect the employees' view of their own economic and financial

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[4]Putnam is somewhat sceptical concerning the role of unions in the United States: "Although unions [...] have often been plagued by oligarchy, apathy, and corruption, historically they both created and depended on social capital – that is, networks of reciprocity. By the end of the twentieth century this once central element in the social life of working Americans had virtually vanished" (Putnam, 2020, p. 81).

[5]"There is no single definition of social capital" (OECD, 2001, p. 40). Some authors define it in a manner that the strength of trade unions is one indicator of its extent (see, e.g., Alesina and La Ferrara, 2000). Such a perspective is compatible with our approach if union members feature more social capital with regard to its other dimensions.

situation. Such an effect can arise as unions provide members with detailed information about economic developments both for the entire economy and individually. Moreover, trade unions can furnish job-related information, which allows members to better evaluate the prospects of their professional future. To garner support for their activities, trade unions are more likely to emphasize adverse aspects of the economic and financial situation (see, e.g., Hammer and Avgar, 2005; Borjas, 1979; Heywood et al., 2002; Freeman and Medoff, 1984, pp. 139f). If a more sceptical evaluation of one's own economic position has negative consequences for life satisfaction, union members can be hypothesized to exhibit a lower level of life satisfaction than non-members.

Finally, a common starting point of many analyses considering the linkage between union membership and life satisfaction is the expectation that job satisfaction of union members exceeds the respective level of non-members. If job and life satisfaction are correlated positively, life satisfaction of union members is likely to exceed life satisfaction of comparable non-members (Flavin et al., 2010; Keane et al., 2012; Flavin and Shufeldt, 2016).[6] In the only comprehensive study of job satisfaction and trade union membership for Germany, Goerke and Huang (2022) document negative correlations in most OLS specifications, which often become insignificant in FE models.[7] Therefore, the job satisfaction channel suggests a non-positive correlation between union membership and life satisfaction.

We conclude the exposition of the channels, which may give rise to an impact of union membership on life satisfaction, with four observations:

First, the channels outlined above are not mutually exclusive but rather complementary as, for example, higher pay may affect life satisfaction directly and also indirectly via job satisfaction. Nonetheless, for analytical clarity, we discuss them separately.

Second, the enumeration of potential channels is unlikely to be exhaustive. Consequently, we expect a correlation between trade union membership and life satisfaction to persist even when we empirically account for all of the above channels.

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[6]There is an intensive debate about whether life satisfaction is best understood using the bottom-up approach and, as a function of satisfaction with life domains that is, inter alia, job satisfaction, or employing the top-down approach, according to which life satisfaction depends on stable personal traits, such as personality characteristics, and is projected on other subjective measures, such as job satisfaction (see, e.g., Erdogan et al., 2012). Obviously, the linkage may also be bi-directional. Our interpretation is more in line with the bottom-up perspective.

[7]Jirjahn and Tsertsvadze (2006) focus on works council and also include trade union information. They observe sometimes insignificant positive correlations. Hipp and Givan (2015) focus on the cross-national variation in the link between job satisfaction and union membership. They find no satisfaction difference between members and non-members for Germany.

Third, the channels we look at may be based on a causal impact of union membership or indicate selection effects. A higher wage may, for example, result from joining a trade union. Alternatively, those employees who are highly motivated and better paid may also be more inclined to become a union member. Our analysis of the channels that influence the relationship between trade union membership and life satisfaction yields insights irrespective of the nature of the linkage.

Fourth, a comparison of the findings for the various channels can provide valuable insights: The first and the second channels, higher wages and greater social capital, relate to actual outcomes. In contrast, the third and fourth channels refer to expectations, namely about job security and the economic situation. Systematic differences between these two groups of channels can be informative about whether trade union membership actually yields benefits or primarily affects the perception of outcomes. The fourth and fifth channels, concerns about the economic situation and job satisfaction, represent encompassing measures of the potential effects of union membership. Their analysis can provide information about whether the dissatisfaction of members is based on broader job-related and economic aspects of union membership, beyond the effects on wages and job security. Finally, channels two and four relate to social capital and the economic situation and, therefore, to potential consequences of union membership not directly associated with the job. The findings for these outcomes can help to ascertain whether the analysis of life satisfaction provides insights, which extend beyond those obtained from considering job satisfaction.

4 Previous Analyses

Radcliff (2005) provides an early analysis of the linkage between an employee's trade union membership and life satisfaction. He estimates a linear model, using data for 17 countries from the 1990 wave of the World Value Survey (WVS) and finds a positive correlation. A number of further studies also use the WVS, focusing on different waves and countries. Flavin et al. (2010) document a positive linkage for 14 industrialised countries in OLS specifications, particularly for low-income individuals. Charman and Owen (2014) use a larger sample covering 49 countries. In ordered probit specifications, they find a positive correlation between union membership and life satisfaction, which they no longer obtain for a subsample of high-income countries. Flavin and Shufeldt (2016) focus on the United States and observe a positive correlation in OLS and Ordered

Probit models. Employing data from the United States Gallup Daily Tracker, Artz et al. (2022) and Blanchflower et al. (2022) also report a positive correlation for OLS models. Moreover, Blanchflower et al. (2022) document a qualitatively comparable relationship for almost 40 European countries, based on the European Social Survey, without providing results for individual countries. Guzi and de Pedraza García (2015) utilise a web-based survey for Spain and observe a positive correlation in an OLS specification. In the context of a completely different industrial relations system and employing OLS and FE specifications, Booth et al. (2022) show that rural-urban migrant workers in China who belong to real (and not to so-called paper) unions exhibit higher happiness than non-members. Finally, using South Korean household panel data, Lee (2022) finds no correlation between union membership and life satisfaction in firms where a union is present in a correlated random effects panel ordered probit model.

In sum, most previous investigations present findings consistent with the theoretical expectation of a positive impact of union membership on life satisfaction. However, the correlations do not always appear to be robust to variations in the sample or estimation method. Moreover, most studies base their insights on inter-personal comparisons.[8]

For Germany, there is no thorough study of the relation between trade union membership and life satisfaction. Humpert (2013) documents a negative (insignificant) relationship for females (males) when analysing gender differences in the effects of social participation, using the German General Social Survey (ALLBUS). Goerke and Huang (2022) analyse the relationship between trade union membership and job satisfaction. Employing SOEP data they find a negative association in OLS-models that can no longer be observed in FE specifications. The authors conjecture that individuals with time-invariant unobservable characteristics negatively associated with job satisfaction may sort into union membership. To scrutinize this hypothesis, they also look at the relationship between union membership and life satisfaction and report significantly negative correlations for OLS and FE models. The present contribution builds on these initial estimates by Goerke and Huang (2022) and extends their findings to subgroups, evaluates potential mechanisms that bring about the

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[8]Contributions also look at the relationship between union density and life satisfaction in the United States (Coshow and Radcliff, 2009; Chen and Islam, 2023). Moreover, there are studies for different samples of mostly industrialised countries, using data either from Eurobarometer (Radcliff, 2005) or the WVS (Radcliff, 2005; Flavin et al., 2010; Keane et al., 2012). These analyses tend to find positive correlations. Finally, Addison and Teixeira (2022) document a positive relationship between worker representation, i.e. if there is a trade union, works council or committee representing employees at the workplace, and life satisfaction, using the European Working Conditions Survey (EWCS).

negative correlation and investigates the impact of labour market institutions, such as collective bargaining and co-determination.

5 Data and Methodology

We use data from the German Socio-Economic Panel (SOEP, version 36). The SOEP is a representative and rich longitudinal dataset of private households in Germany (see Goebel et al. (2019) for more information). It provides information on individuals' demographic and work-related characteristics. Our study focuses on employed individuals aged between 16 and 65. The observation period ranges from 1985 to 2019, the first and the last year for which information on union membership status is available.

5.1 Definition of Variables

The dependent variable measures a respondent's life satisfaction. The respective question is asked in each wave and possible answers range from 0 (completely dissatisfied) to 10 (completely satisfied). The main explanatory variable, union membership status, is a dummy variable that takes the value of one if an individual is a member at the time of the interview and zero otherwise. The questionnaire contains the corresponding question at irregular intervals, namely in 1985 and 1989 for West Germany, in 1990 for Eastern Germany, and in 1993, 1998, 2001, 2003, 2007, 2011, 2015, and 2019 for the entire country, which was reunited in October 1990.

We separate further independent variables into three broad categories. The first includes demographic and labour market variables. The former include age (level & quadratic terms), being female, being married, years of education (level & quadratic terms), and the number of children living in the household. We differentiate labour market variables into those which are relatively exogenous from an individual's perspective and a second group, for which this is more difficult to argue. The first group includes dummy variables taking the value of one if a respondent works in the public sector, is a civil servant, a blue-collar worker, and 16 dummy variables indicating the industry affiliation (at the 2-digit NACE level). The second set of labour market related variables incorporates information on actual weekly working hours, tenure (level & quadratic terms), and a dummy variable indicating that the respondent has joined the firm within the last year.

The second category of variables is utilised to analyse the channels outlined in Section 3.2. We use the natural logarithm of the gross labour income in the previous month to compute the wage mark-up. It includes overtime remuneration, but does not incorporate one-time payments, such as vacation pay or bonuses. To derive a measure of social connectedness, we follow Winkelmann (2009) and Bauernschuster et al. (2014), and focus on the networking aspect of social capital. In particular, we utilise information on leisure-related activities and the participation in organised events. To do so, we employ a range of questions about how individuals spend their leisure time.[9] The answers to each question range from 1 "*at least once per week*" to 4 "*never*". We recode them such that the more one performs an activity the higher the score is. Moreover, we average the answers over all responses in each year, such that our indicator of social capital can range from one to four.[10] We derive indicators of an individual's perceptions of job security and the economic situation from the following questions: "*How concerned are you about the following issues?*". The list of topics includes "*Your job security*" and "*Your own economic situation*". The possible answers are 1 "*very concerned*", 2 "*somewhat concerned*", and 3 "*not concerned at all*" and higher values indicate fewer concerns. Finally, job satisfaction is measured on an 11-point scale ranging from 0 (completely dissatisfied) to 10 (completely satisfied).

In a subset of SOEP waves, there is information about collective bargaining coverage and the existence of a works or personnel council in the respondent's establishment. From these we construct our third category of independent variables. First, we use the question "*Are you paid according to a collectively agreed wage agreement?*". The SOEP contains this enquiry and information about union membership simultaneously in 2015 and 2019. Second, the information concerning co-determination at the establishment level is derived from: "*Does a works or a personnel council exist at your place*

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[9]The responses provide information about visiting or being visited by neighbours, friends, or acquaintances; attending cultural events such as opera, classical concerts, theatre, exhibitions; going to the cinema, pop concerts, dance events, clubs, taking part in sports; artistic and musical activities (painting, music, photography, theatre, dance); meeting with friends, relatives or neighbours; helping out friends, relatives or neighbours; doing volunteer work in clubs, associations, or social services; participating in activities of political parties, municipal politics, citizens' initiatives; going to church, and attending religious events. Bauernschuster et al. (2014) intensively discuss the merits of this battery of questions as encompassing measure of social capital.

[10]Averaging over all responses allows to accommodate two features of the data. First, the respective questions have not been asked in all waves (see Table A-1 in the appendix). The years 1989 and 1993 do not contain any of the relevant questions and are therefore omitted. Moreover, in 1998, 2003 and 2019 the answers include a fifth category, which includes undertaking the activity on a "*daily*" basis. We include such responses in the next highest category, "*weekly*". Second, by averaging we do not lose observations if single items on the list of queries relating to social capital remain without response. We divide the sum of the scores by the number of questions answered. The wording of the questions slightly varied over time.

of work?". This question and the one on union membership are asked contemporaneously in 2001, 2011, and 2019.

In all specifications, we control for federal state and survey year fixed effects. We exclude all observations with missing values. Our main estimating sample consists of 88,739 observations from 39,218 individuals. 59,537 observations stem from 29,162 individuals who never belonged to a trade union, while 8,430 observations relate to 4,093 individuals who were a member of a trade union in all survey waves in which we observe them. Moreover, 5,963 individuals (20,772 observations) reported changes in the membership status. In particular, 1,352 individuals joined, 2,990 left, and 1,621 reported both entry and exit.

Since the information needed to scrutinise the various channels is not available in all years and is not provided by all respondents, the respective estimations are based on 73,151 observations (from 35,920 individuals). The sample incorporating information about collective bargaining consists of 22,678 observations (from 18,117 individuals), while the co-determination sample includes 27,415 observations (from 22,024 individuals).

5.2   Model

We initially report OLS estimates. In order to control for time-invariant observable and unobservable factors that might be correlated with union membership and life satisfaction, we also employ FE regressions. We estimate the following model:

$$LS_{it} = \beta_0 + \beta_1 TU_{it} + \boldsymbol{\beta_2 X_{it}} + \lambda_i + \lambda_t + \varepsilon_{it}, \tag{1}$$

where LS_{it} is life satisfaction of individual i interviewed in year t and TU_{it} indicates the union member status. $\boldsymbol{X_{it}}$ is a vector of control variables, including federal state fixed effects. λ_i indicates individual fixed effects (omitted in OLS specifications), while λ_t represents a set of year dummy variables. ε_{it} is the error term. We cluster standard errors at the individual level.

We focus on linear models since they are more straightforward to interpret. Using SOEP data, Ferrer-i-Carbonell and Frijters (2004) show that OLS models yield results equivalent to those for non-linear models. To substantiate this equivalence for our analysis, we provide results from an Ordered Probit model as a robustness check for the main analysis.

6 Results

6.1 Descriptive Evidence

Table 1 reports the summary statistics for the main variables. In our main estimating sample, 21.37% of all observations are union members. There is a substantial gender gap in union membership. While 43.54% of the observations are female, among union members this share amounts to 32.91%. Union members are, on average, older than non-members, have longer tenure, are more likely to work in the public sector, in blue-collar occupations and large companies. Most importantly, from our perspective, union members exhibit a level of life satisfaction that is around 0.15 points lower than the level reported by non-members.[11]

TABLE 1: Summary statistics of the main estimation sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All observations				Members	Non-members	Difference in the mean
	mean	s.d.	min	max	mean	mean	(col. 5 − col. 6)
life satisfaction	7.2035	1.6670	0	10	7.0870	7.2351	-0.1481***
TU member	0.2137	0.4099	0	1	1	0	
age	41.1792	11.7733	16	65	42.8811	40.7166	2.1645***
female	0.4354	0.4958	0	1	0.3291	0.4643	-0.1352***
married	0.5739	0.4945	0	1	0.6336	0.5577	0.0759***
education	12.1561	2.5946	7	18	11.7898	12.2556	-0.4658***
children in HH	0.5767	0.8874	0	10	0.5660	0.5796	-0.0136***
hours worked	38.9923	12.1470	0.5000	80	40.1111	38.6882	1.4229***
public sector	0.2623	0.4399	0	1	0.3568	0.2366	0.1203***
civil servant	0.0709	0.2566	0	1	0.1164	0.0585	0.0578***
blue-collar worker	0.3017	0.4590	0	1	0.4354	0.2653	0.1701***
tenure	10.6454	10.1204	0	50.9170	14.5978	9.5711	5.0266***
new job	0.1226	0.3280	0	1	0.0650	0.1383	-0.0733***
firm size							
self-employed w/o employees	0.0215	0.1449	0	1	0.0025	0.0266	-0.0242***
< 20	0.2378	0.4258	0	1	0.0706	0.2833	-0.2126***
[20, 200)	0.2683	0.4431	0	1	0.2279	0.2793	-0.0514***
[200, 2000)	0.2213	0.4151	0	1	0.2817	0.2049	0.0769***
≥ 2000	0.2511	0.4337	0	1	0.4173	0.2059	0.2114***
observations		88,739			18,077	70,662	
individuals		39,218			9,353	33,763	

Notes: This table shows summary statistics of the main estimation sample using individual-level weighting factors. Observation period is 1985–2019. In columns (1)–(4), we show statistics for the whole sample, in column (5) for trade union members, and in column (6) for non-members. Column (7) shows the difference in means between column (5) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

When we look at the distribution of replies to the life satisfaction question, Figure 1 indicates

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[11]We provide summary statistics for the estimating samples, which incorporate the information required to evaluate the channels outlined in Section 3.2, and accounting for co-determination or collective bargaining in Tables A-2 to A-4 in the appendix. The differences between union members and non-members depicted in Table 1 also exist for the subsamples, with the exception of life satisfaction in the collective bargaining sample.

that the most frequent answers are those to the left and right of the mean value. Moreover, union members are less likely to state that they are almost completely satisfied with their life (particularly responses 8 and 9), whereas they are more likely to provide intermediate answers (especially responses 5 and 6).

FIGURE 1: Distribution of life satisfaction responses for union members and non-members

6.2 Main Findings

Table 2 depicts estimation results from OLS models (Panel (A)) and FE models (Panel (B)) for the main estimating sample. Column (1) shows a simple correlation between trade union membership and life satisfaction, including year and federal state fixed effects as covariates. The estimated coefficients are negative and statistically significant. Adding demographic controls (in column (2)) and information on labour market characteristics (in column (3)) does not qualitatively change the estimates.[12] The specification in column (3) contains both groups of labour market characteristics, the relatively exogenous ones and those which can be argued to be affected by union membership. If we only include the former, the estimated coefficient on the union membership dummy (not depicted) is not statistically different from the one depicted in column (3) of Table 2. Hence, our findings hold even if bad controls existed.

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[12]The findings are robust to the use of an Ordered Probit model (see Table A-5 in the appendix).

TABLE 2: Correlation between trade union membership and life satisfaction

	(1)	(2)	(3)
Panel (A): OLS estimates			
TU member	-0.0863***	-0.0489***	-0.0966***
	(0.0188)	(0.0189)	(0.0195)
Panel (B): FE estimates			
TU member	-0.0579**	-0.0578**	-0.0636**
	(0.0252)	(0.0251)	(0.0252)
<u>control variables</u>			
year/state fixed effects	X	X	X
demographic controls		X	X
labour market controls			X
observations		88,739	
individuals		39,218	

Notes: This table shows the relationship between trade union membership and life satisfaction. The observation period is 1985–2019. Demographic characteristics include age (level & quadratic terms), being female, being married, years of schooling (level & quadratic term), and the number of children in the household. As labour market factors, we include relatively exogenous factors like working in the public sector, being a civil servant, being a blue-collar worker, and dummy variables for firm size and industrial sectors, as well as less exogenous factors, such as actual work hours per week, years of tenure (level & quadratic terms), and having a new job (tenure shorter than one year). Federal state fixed effects and year fixed effects are accounted for in all specifications. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The results show that life satisfaction of union members is substantially lower than that of non-members. The estimated effects are quantitatively sizeable and, focusing on the FE model, roughly equivalent to moving from a medium or large firm to one with less than twenty employees (see Table A-6 in the appendix, which contains the full set of results for the specification in column (3)). The feature that the estimated coefficient in the FE model is somewhat smaller in magnitude than in the OLS specification is compatible with the view that individuals who generally express lower levels of satisfaction sort into union membership. However, the significant correlation in FE specifications clarifies that sorting cannot entirely explain for the observed negative relationship.

Table 1 indicates that a relatively large majority of union members in Germany is male (see also OECD and AIAS, 2021). In consequence, trade unions may better represent the interests of male members, such that the life satisfaction effect of union membership could be gender-specific.[13] Panel (A) of Table 3 documents a significant and negative correlation of about the same magnitude for males and females in OLS models (see columns (1) and (3)). Accounting for individual fixed

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[13]There also is substantial evidence of gender-specific differences in life satisfaction for many countries, though not necessarily for Germany (see, e.g., Blanchflower and Bryson, 2023).

effects does not qualitatively alter the findings for males, while the estimated negative coefficient for females becomes statistically insignificant (see columns (2) and (4)). Therefore, our findings do not support the conjecture that unions act primarily on behalf of their male membership.

Recent studies show that the association between union membership and job satisfaction varies across time and birth cohorts (Blanchflower and Bryson, 2022; Blanchflower et al., 2022; Goerke and Huang, 2022). Moreover, the relationship with life satisfaction turns positive in the United States and the EU after the great recession (Blanchflower et al., 2022). To analyse whether a similar feature is observable for Germany, we create two subsamples of about equal size; one consisting of early observations surveyed in and before 2003, and a second one with responses collected in the second half of our observation period. Both OLS and FE estimates are statistically significant and negative for individuals surveyed in or before 2003 (see columns (1)–(2) of Panel (B) in Table 3). When looking at the employees surveyed in later years (see columns (3)–(4)), the OLS estimate is negative and marginally significant, while the magnitude of the estimated coefficient is substantially smaller than in column (1). The FE estimate is statistically insignificant.[14]

TABLE 3: Trade union membership and life satisfaction: Effect heterogeneity

	(1) OLS	(2) FE	(3) OLS	(4) FE
Panel (A): Gender				
	Males		Females	
TU member	-0.0985***	-0.0791**	-0.1035***	-0.0398
	(0.0247)	(0.0319)	(0.0323)	(0.0410)
observations		47,336		41,403
individuals		20,260		18,958
Panel (B): Survey years				
	Surveyed in/before 2003		Surveyed after 2003	
TU member	-0.1174***	-0.1065***	-0.0493*	0.0342
	(0.0253)	(0.0343)	(0.0260)	(0.0460)
observations		44,508		44,231
individuals		19,753		26,573

Notes: This table shows the heterogeneous associations between trade union membership and life satisfaction by gender (Panel (A)) and survey year (Panel (B)). OLS estimates are depicted in columns (1) and (3) and FE estimates in columns (2) and (4). The covariates are the same as in the specification (3) of Table 2, with the exception of the gender dummy in Panel (A). Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Furthermore, we have split the sample according to birth year and age. To ascertain whether

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[14]We have also estimated the model delineated in equation (1) for individuals surveyed in 2011, 2015, and 2019, i.e., after the Great Recession, to make our approach as comparable as possible to that of Blanchflower et al. (2022). The results show similar patterns as in columns (3) and (4) of Panel (B) in Table 3. Furthermore, the estimated coefficients in OLS models for single years are always negative and lose statistical significance from 2007 onwards.

the relationship between union membership and life satisfaction varies across birth cohorts as, for example, Blanchflower et al. (2022) document for the linkage between membership and job satisfaction in the United States, we consider separately individuals born in or before the median birth year 1964 and afterwards. To look at the possibility of age effects we split the sample into observations aged 41 or younger at the time of the interview and a second group aged 42 or older. Using these samples, we observe that both OLS and FE estimates are statistically significant and negative for the older cohort and insignificant for the younger. All four estimated coefficients for the different age groups are negative, with the one resulting from the FE specification for the older individuals being statistically insignificant (see Table A-7 in the appendix).

The findings that the negative relationships between union membership and life satisfaction becomes weaker or statistically insignificant after 2003 and for individuals born later than 1964, while there are no clearly identifiable patterns across age groups, suggest the absence of strong changes over time or age cohorts. We may instead interpret the results outlined above in conjunction with the feature of a declining union density over time. This fall could imply, in contrast to the hypothesis usually put forward when investigating the exit-voice perspective, that only those individuals remain in a trade union, or join it, whose benefits from membership are particularly large as the costs of membership have remained basically unchanged. Their dissatisfaction is likely to be smaller than of individuals who benefit to a lesser extent from membership. From this perspective, the negative relationship between union membership and life satisfaction has become weaker over the years because the remaining members perceive the benefits of membership to be larger than in earlier periods. However, in contrast to other countries we obtain no evidence for Germany that the relationship between union membership and life satisfaction has turned positive since the great recession or in recent years (Artz et al., 2022; Blanchflower et al., 2022).

6.3 Potential Channels

In each of the subsequent subsections, we proceed as follows: First, we document the relationship between union membership and the variable under scrutiny, both descriptively and based on OLS and FE models. This step helps to establish whether the potential channel exists. We also re-estimate our baseline specification with life satisfaction as the dependent variable for the smaller sample that we use to analyse the various channels. This clarifies whether the change in the esti-

mating sample has an impact. Second, we include the respective variable as an additional covariate into the baseline specification. By comparing the estimated coefficients for the union membership dummy with and without the additional covariate, we can ascertain whether the relationship between union membership and life satisfaction operates via the channel considered. Finally, we discuss the insights from combining the results for alternative combinations of explanations and we consider all potential channels at once.[15]

6.3.1 Union Wage Premium

The average gross monthly wage of union members is slightly, but significantly, higher than that of non-members. This feature can be observed descriptively and in OLS and FE specifications with the natural logarithm of the wage as the dependent variable and union membership as the independent variable (see Tables A-8 and A-9 in the appendix). Wage income may, therefore, represent a channel through which union membership affects life satisfaction.

Next, we estimate our standard specifications with life satisfaction as the dependent variable. We observe that wages are positively correlated with life satisfaction. The estimated coefficients on the union membership dummy in column (2) of Table 4 are somewhat larger in absolute value, i.e. more negative, than the ones shown in column (1), which depicts the findings for the same sample but without the wage variable. Therefore, wage income can constitute a channel giving rise to a correlation between union membership and life satisfaction. However, this channel cannot help explain the observed correlation as its consideration tends to strengthen the negative relationship.

6.3.2 Social Capital

While the descriptive evidence delineated in Table A-8 suggests that union members and non-members have similar levels of social capital, the regression-based analysis indicates a positive correlation (see column (2) of Table A-9). In the specification with life satisfaction as the dependent variable, we detect a positive correlation with social capital in OLS and FE models (see column (3) of Table 4). The estimated coefficients on the union membership dummy are larger in absolute

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[15]Such a summary perspective requires information on all channels for all observations. As indicated in Section 5.1, this restriction reduces sample size by about 17%. To ensure that this loss of information does not affect results concerning the specific channels, we also estimate the specifications reported upon below in subsections 6.3.1 to 6.3.5 separately for the maximum samples available. The results are qualitatively identical to those reported in Table 4 and depicted in Table A-10 in the appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel (A): OLS estimates							
TU member	-0.0791***	-0.0887***	-0.1015***	-0.0511**	-0.0530***	-0.0457**	-0.0481***
	(0.0209)	(0.0209)	(0.0207)	(0.0204)	(0.0195)	(0.0179)	(0.0171)
ln (wage)		0.2094***					0.0779***
		(0.0127)					(0.0099)
social capital			0.4539***				0.3133***
			(0.0172)				(0.0142)
job security				0.4810***			0.0560***
				(0.0110)			(0.0103)
economic concerns					0.7596***		0.5197***
					(0.0109)		(0.0106)
job satisfaction						0.3359***	0.2902***
						(0.0038)	(0.0037)
Panel (B): FE estimates							
TU member	-0.0718**	-0.0760**	-0.0775***	-0.0588**	-0.0633**	-0.0705**	-0.0668**
	(0.0297)	(0.0297)	(0.0297)	(0.0293)	(0.0291)	(0.0280)	(0.0276)
ln (wage)		0.1151***					0.0555***
		(0.0178)					(0.0158)
social capital			0.2047***				0.1811***
			(0.0238)				(0.0221)
job security				0.2933***			0.0995***
				(0.0134)			(0.0130)
economic concerns					0.4631***		0.3456***
					(0.0134)		(0.0134)
job satisfaction						0.2112***	0.1889***
						(0.0049)	(0.0049)
observations				73,151			
individuals				35,920			

Notes: This table shows how the natural logarithm of the gross monthly wage, social capital, job security, economic concerns, and job satisfaction perform as channels between trade union membership and life satisfaction. OLS estimates are depicted in Panel (A) and FE estimates in Panel (B). Apart from the added channel variables, the covariates are the same as in the specification (3) of Table 2. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

value, i.e. more negative, than the ones shown in column (1). Therefore, social capital can act as a channel between union membership and life satisfaction. However, as it is the case for wages, it cannot help explain the observed negative correlation.

6.3.3 Job Security

Table A-8 shows that union members are more concerned about job security than non-members as a higher value of the job security indicator implies fewer concerns. Regressing job security concerns on union membership generates the same finding (see column (3) of Table A-9). Since there is no evidence that the actual job security of union members is lower than that of non-members, as, for

example, the tenure of members is substantially higher than that of non-members (see Table 1), members may view a given situation more sceptically, possibly because union communication draws their attention to such aspects. While it is beyond the scope of the present analysis to ascertain the reason for the negative correlation, it implies that lower perceived job security can constitute a channel through which union membership contributes to lower life satisfaction.

When we include the variable measuring concerns about job security into our baseline estimation models, column (4) of Table 4 shows that individuals with fewer concerns exhibit higher life satisfaction. The coefficients on union membership become smaller in magnitude compared to the ones in column (1). Therefore, individuals' concerns about job security may perform as a channel between union membership and life satisfaction, which could partially elucidate the negative correlation.

6.3.4 Economic Concerns

Descriptively, union members are more concerned about their own economic situation (see Table A-8). This statement is consistent with the findings from an OLS specification but is no longer true when individual fixed effects are accounted for (see column (4) of Table A-9). This suggests that economic concerns may not constitute a channel through which union membership affects life satisfaction in Germany once time-invariant individual-specific effects are considered.

When we incorporate the variable measuring economic concerns into our baseline estimation models, where a higher value implies fewer concerns, column (5) of Table 4 shows that less concerned individuals exhibit higher life satisfaction. The estimated coefficients on union membership become smaller in magnitude in OLS and FE models, relative to the specification depicted in column (1). In consequence, based on the OLS estimates, greater economic concerns can constitute another channel giving rise to a negative correlation between union membership and life satisfaction.

6.3.5 Job Satisfaction

The average level of job satisfaction is lower for union members than non-members (see Table A-8 in the appendix). This descriptive evidence is consistent with the findings from an OLS model. However, when individual fixed effects are accounted for, we no longer discern a correlation (see column (5) in Table A-9 and comparable findings by Goerke and Huang (2022)). These

results indicate that job satisfaction may not constitute a channel through which union membership affects life satisfaction in Germany, once time-invariant individual-specific effects are taken into consideration.

When we include job satisfaction as an additional covariate in the estimation specified in equation (1), we observe a positive correlation between job satisfaction and life satisfaction (see column (6) of Table 4). Comparing OLS models, we find that the size of the estimated coefficient on union membership is smaller in absolute value in column (6) than in column (1), while the FE estimates do not differ markedly. Based on these findings, we conclude that the negative correlation between union membership and life satisfaction observed from the OLS model is partly driven by the channel of job satisfaction. However, job satisfaction does not perform as a channel in FE specifications.

In addition, our findings suggest that more unpleasant working conditions for union members than for non-members cannot be the cause of the life satisfaction differential. This interpretation is based on the assumption that working conditions primarily reflect the evaluation of the job. When including job satisfaction as a covariate, working conditions are indirectly accounted for. Nonetheless, the estimated coefficient for the union membership dummy remains negative.

6.3.6 A Summary Perspective

If we focus on the findings for wages and social capital (see subsections 6.3.1 and 6.3.2), they indicate that employees gain from union membership and that these actual benefits tend to mitigate the observed negative correlation between union membership and life satisfaction. The results concerning the perceptions of job security and the economic situation (see subsections 6.3.3 and 6.3.4) suggest that union members may have lower life satisfaction because they are more concerned about job-related and also non job-related circumstances. There is, however, no indication that the actual outcomes experienced by union members are worse than of comparable non-members. This provides support for the conjecture that different expectations of members, which possibly trade unions cannot fulfil, explain the negative correlation between membership and life satisfaction. It should be noted though that the estimated coefficients for the union membership dummy, depicted in columns (4) and (5) of Table 4, are still negative and are not markedly smaller than the ones in column (1). Therefore, our findings provide no indication that disappointed expectations about the benefits of membership constitute the main reason for the negative relationship between union

membership and life satisfaction.

Furthermore, the relevance of the channels related to social capital and economic concerns (see subsections 6.3.2 and 6.3.4) and the finding of a negative association between union membership and life satisfaction also when including job satisfaction as a covariate underline our starting point, namely, that the well-being effects of union membership extend beyond the domain of work.

To complete the analysis of potential channels, we estimate equation (1) and jointly include the empirical proxies for the five channels. The estimated coefficients for the union membership dummy are significantly negative. They are somewhat smaller in absolute value than the ones for the model without accounting for the various channels in OLS and FE specifications (compare columns (7) and (1) in Table 4), though not significantly so. Hence, the multiple channels may help to explain part of the negative correlation between trade union membership and life satisfaction in Germany.

6.4   Institutions

Collective bargaining and co-determination are essential elements of the German industrial relations system (Jäger et al., 2022b). The estimations presented thus far have not incorporated these aspects. This is because the relevant information about institutions and union membership is available simultaneously in the 2015 and 2019 waves for collective bargaining and three waves in the second half of the observation period for works and personnel councils (see Section 5.1). From the sample with information on the existence of a works and personnel council, we exclude self-employed respondents and those who work in establishments with fewer than five employees because councils can only be established if this size threshold is exceeded. Using the restricted samples, we re-estimate equation (1) and present the OLS estimates in Table A-11 in the appendix. We find (quantitatively) weaker results than in Panel (A) of Table 2 in the sample with information about works and personnel councils, while there is no statistically significant association between union membership and life satisfaction in the collective bargaining sample.

To further account for collective bargaining and co-determination, we estimate OLS specifications of the baseline models for employees working in firms covered by a bargaining agreement and

not covered by one, and with and without a works or personnel council, separately.[16] The negative correlation between union membership and life satisfaction is not discernible for employees covered by collective bargaining agreements and is more pronounced for uncovered employees than for the entire sample (see Panel (A) of Table 5 and column (1) of Table A-11 in the appendix). Turning to co-determination, the estimates suggest a quantitatively more pronounced negative correlation for employees who work in establishments without a works or personnel council (see Panel (B) of Table 5).

TABLE 5: Trade union membership and life satisfaction: Institutions

	(1)	(2)
Panel (A): Collective bargaining		
	no collective bargaining	collective bargaining
TU member	-0.1822***	-0.0094
	(0.0685)	(0.0370)
observations	10,020	12,658
individuals	8,241	9,876
Panel (B): Co-determination		
	no council	works or personnel council
TU member	-0.1444**	-0.0557*
	(0.0697)	(0.0295)
observations	10,617	16,798
individuals	9,284	13,713

Notes: This table shows the heterogeneous associations between trade union membership and life satisfaction by collective bargaining (Panel (A)) and works and personnel council (Panel (B)). The estimation method used is OLS in both panels. The covariates are the same as in specification (3) of Table 2. In Panel (B), the variable indicating a firm size of less than 20 employees includes neither self-employed nor respondents working in establishments with fewer than 5 employees. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Because collective bargaining and co-determination are most likely to exist in large establishments (Ellguth and Kohaut, 2022) and industries with strong unions, we also estimate equation (1) for two further sets of subsamples to ascertain the relevance of institutions. The first distinguishes between respondents who work in establishments with 2000 or more employees, on the one hand, and employees in smaller firms, on the other hand. The second divides employees into two groups according to whether they work in an industry where union density, calculated from our SOEP sample, is above or below the median. Employing firm size and union density as proxies for the coexistence of bargaining coverage and co-determination allows us to use information for the entire observation period 1985 to 2019.

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[16]Given the small number of SOEP waves in which the relevant information is available, and the sometimes substantial number of intermittent years, FE models are not well identified.

TABLE 6: Trade union membership and life satisfaction: Firm size and trade union density

	(1) OLS	(2) FE	(3) OLS	(4) FE
Panel (A): Firm Size				
	Under 2000 employees		2000 employees and more	
TU member	-0.1255***	-0.1196***	-0.0423	0.0563
	(0.0238)	(0.0322)	(0.0311)	(0.0497)
observations	66,877		21,862	
individuals	31,958		12,366	
Panel (B): Trade union density				
	Trade union density low		Trade union density high	
TU member	-0.1350***	-0.1297**	-0.0811***	-0.0106
	(0.0369)	(0.0545)	(0.0223)	(0.0300)
observations	34,329		54,410	
individuals	18,335		26,176	

Notes: This table shows the heterogeneous associations between trade union membership and life satisfaction by firm size (Panel (A)) and trade union density (Panel (B)). Low trade union density is defined by industries with a smaller trade union density than the median: Agriculture, forestry, and fishing; Construction; Trade, maintenance and repair of motor vehicles; Accommodation and food service activities; Financial and insurance activities; Real estate activities, professional, scientific, and technical services; Other economic services; Arts, entertainment, recreation, and other services; Activities of households as employers, production of goods and services by private households for own use, without a predominant product. The covariates are the same as in the specification (3) of Table 2, except that dummy variables for the firm size drop out in columns (3)–(4) in Panel (A). Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel (A) of Table 6 shows for OLS and FE specifications that the correlation between union membership and life satisfaction is quantitatively more pronounced and highly significant in firms with less than 2000 employees but not for individuals working in large firms. We obtain qualitatively similar results when classifying firms with 200 or more employees as large firms, and those with fewer staff as small,[17] and from the distinction according to the union density (see Panel (B)), although the OLS estimate for the high-density sample is significant.

The estimation samples including information about collective bargaining and works and personnel councils contain data primarily for the second half of the observation period covered by our main estimating sample. Since the negative association between union membership and life satisfaction is much stronger for the first half, one may conjecture that the results depicted in Table 5 are actually an observation year effect. However, the findings for the sample of employees not covered by collective bargaining (Panel (A) of Table 5) do not support this conjecture. Instead, the

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[17]200 employees is the next cut-off offered by the SOEP - see Table 1. In particular, the estimated coefficients of the union membership dummy are significantly negative for employees working in small firms (< 200). The estimated coefficient for the sample of large firms (≥ 200) is significantly negative but much smaller in magnitude than for employees in small firms in the OLS specification, whereas the finding for the FE specification is the same as in Panel (A) of Table 6. Detailed results are available upon request.

results of Tables 5 and 6 suggest a different interpretation. Individuals working in smaller firms, not covered by collective bargaining, in establishments without co-determination and in industries featuring a low union density are represented by trade unions that are likely to be less powerful. Hence, these employees may experience fewer gains from their union membership than individuals working in firms where unions are comparatively strong and have greater influence. The resulting disappointment about what trade unions can do for these members may give rise to a negative correlation between union membership and life satisfaction. If this perspective is justified, the relationship is not primarily affected by the two central pillars of the industrial relations system in Germany but by the strength of unions, or by (disappointed) expectations about their impact.

In the public sector, bargaining coverage and union density are much higher than in the private sector. Estimating the specifications depicted in column (3) of Table 2 separately for private and public sector sub-samples could, therefore, provide additional support for the interpretation that the strength of trade unions determines the correlation between union membership and life satisfaction. This line of argument rests on two elements: First, to support the union-strength perspective, the estimated coefficients for the union membership dummy need to be negative for the private sector subsample and smaller in absolute magnitude, insignificant or even positive in the public sector sample. Second, private and public sector unions are comparable, only differ in their strength, and membership is associated with similar benefits and costs in both sectors.[18] The latter assumption is unlikely to hold in Germany. First, the objectives of non-profit oriented employers in the public sector in negotiations with trade unions are likely to differ from those of profit-maximising private-sector firms. Therefore, bargaining outcomes and benefits of membership are likely to differ across sectors. Second, job security is on average much higher in the public sector, reducing the relevance of this aspect of union activities. Third, about 27% of public sector employees are civil servants (see Table 1) who are not allowed to go on strike, can basically not be dismissed, and for whom the public employer has a much more comprehensive duty of care than required in the private sector. Finally, there is substantial evidence that different individuals choose to work in the public than the private sector. While the above features may also give rise to a different relationship between union membership and life satisfaction in the public than the private sector, separate estimates for both sectors do not reveal any qualitative differences. Accordingly, a separate inspection of the

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[18]We are grateful to an anonymous referee for suggesting this additional test of our hypothesis.

two sectors provides no additional support for the hypothesis that the negative correlation between union membership and life satisfaction is restricted to settings in which trade unions are relatively weak.

7   Conclusion

We provide the first comprehensive analysis of the association between trade union membership and life satisfaction for Germany. Using SOEP data from 1985 to 2019, we find a negative and significant relationship in OLS and FE models. The magnitude of the effect is sizeable, as a comparison with an important correlate of life satisfaction clarifies. Based on the FE model with all controls, we observe that union membership is associated with a reduction in life satisfaction by 0.06 points. The same specification indicates that the life satisfaction of an unmarried employee is about 0.15 points lower than the satisfaction level of a married individual, that is, about 2.5 times the union membership effect (see column (2) in Table A-6).

Our analysis indicates that job satisfaction, concerns about the economic situation and job security, wage income and social capital may be channels through which union membership affects life satisfaction. However, other channels may exist and be responsible for the negative correlation. Therefore, limiting attention job satisfaction neglects potentially influential consequences of belonging to a trade union. In addition, our analysis of effect heterogeneity shows that sorting may be stronger for females than males and also in later years of the observation period as the FE specifications yield no significant estimates for females and for employees surveyed after 2003. Moreover, the association between union membership and life satisfaction may have become weaker over time, though we cannot discern systematic birth cohort effects. In contrast to other countries, the relationship between union membership and life satisfaction has not turned positive in Germany recently. Finally, the negative correlation between union membership and life satisfaction seems much stronger in surroundings where trade unions are relatively weak.

Our findings are compatible with the view that disappointed expectations about outcomes affected by union activities are a component of the negative relationship between union membership and life satisfaction. However, other channels are relevant as well, as the negative association persists even when empirically accounting for indicators of disappointed expectations. Our conclusion

can at most be tentative, though, since the data does not allow us to contrast expectations about outcomes with the actual realisations of these outcomes. Therefore, the disappointed expectations perspective deserves further scrutiny.

Finally, the results suggest that union membership may have systematic well-being consequences that are not directly related to work. This insight provides substance to our approach. Moreover, it emphasizes the importance of further studies employing more encompassing indicators of the consequences of trade union membership for individuals that extend beyond job-related outcomes, such as wages or job satisfaction.

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Trade unions and life satisfaction in Germany

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Supplementary Material

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Appendix   Tables Cited in the Main Text

TABLE A-1: Availability of social capital indicators

	(1) 1985	(2) 1989	(3) 1990	(4) 1993	(5) 1998	(6) 2001	(7) 2003	(8) 2007	(9) 2011	(10) 2015	(11) 2019
visit neighbour					X		X				X
classic culture	X		X		X	X	X	X	X	X	X
modern culture	X		X		X	X	X	X	X	X	X
active sport	X		X		X	X	X	X	X	X	X
art					X	X	X	X	X	X	X
meet friends	X		X			X		X	X	X	
help friends	X		X			X	X	X	X		
voluntary work	X		X		X	X	X	X	X	X	
political	X		X		X	X	X	X	X	X	
church			X		X	X	X	X	X	X	X

Notes: This table shows the ten variables used to derive the social capital indicator. For each variable, the years in which the corresponding question is available is marked by an "X". For further details, see Section 4.2.

1

TABLE A-2: Summary statistics of the channel sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All observations				Members	Non-members	Difference in the mean
	mean	s.d.	min	max	mean	mean	(col. 5 − col. 6)
life satisfaction	7.2243	1.6403	0	10	7.1187	7.2519	-0.1332***
TU member	0.2066	0.4049	0	1	1	0	
age	41.7331	11.6086	17	65	43.5892	41.2496	2.3396***
female	0.4416	0.4966	0	1	0.3398	0.4681	-0.1283***
married	0.5644	0.4958	0	1	0.6247	0.5487	0.0760***
education	12.3188	2.6115	7	18	11.9624	12.4116	-0.4492***
children in HH	0.5700	0.8806	0	10	0.5503	0.5752	-0.0249***
hours worked	39.1127	11.9230	1	80	40.2311	38.8214	1.4097***
public sector	0.2626	0.4401	0	1	0.3617	0.2368	0.1250***
civil servant	0.0700	0.2551	0	1	0.1186	0.0573	0.0613***
blue-collar worker	0.2882	0.4529	0	1	0.4104	0.2564	0.1540***
tenure	10.8213	10.1975	0	50.917	15.0785	9.7124	5.3660***
new job	0.1195	0.3244	0	1	0.0626	0.1343	-0.0717***
firm size							
self-employed w/o employees	0.0190	0.1366	0	1	0.0024	0.0234	-0.0210***
< 20	0.2338	0.4232	0	1	0.0731	0.2756	-0.2026***
[20, 200)	0.2717	0.4448	0	1	0.2275	0.2832	-0.0557***
[200, 2000)	0.2223	0.4158	0	1	0.2799	0.2073	0.0726***
≥ 2000	0.2532	0.4348	0	1	0.4172	0.2105	0.2067***
observations		73,151			14,406	58,745	
individuals		35,920			8,418	30,424	

Notes: This table shows summary statistics of the channel sample using individual-level weighting factors. Except for 1989 and 1993, in which there are no observations for social capital, all the other sample years are included. In columns (1)–(4), we show statistics for the whole sample, in column (5) for trade union members, and in column (6) for non-members. Column (7) shows the difference in means between column (5) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A-3: Summary statistics of the collective bargaining sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All observations				Members	Non-members	Difference in the mean
	mean	s.d.	min	max	mean	mean	(col. 5 − col. 6)
life satisfaction	7.5477	1.5240	0	10	7.5230	7.5527	-0.0297
TU member	0.1703	0.3759	0	1	1	0	
age	43.7819	11.8542	18	65	47.1373	43.0932	4.0441***
female	0.4719	0.4992	0	1	0.3717	0.4925	-0.1208***
married	0.5309	0.4991	0	1	0.5523	0.5265	0.0258**
education	12.7742	2.7432	7	18	12.5261	12.8252	-0.2991***
children in HH	0.5139	0.8614	0	10	0.3984	0.5376	-0.1391***
hours worked	37.4890	11.4389	1	80	38.9909	37.1807	1.8103***
public sector	0.2659	0.4418	0	1	0.3629	0.2460	0.1168***
civil servant	0.0683	0.2522	0	1	0.1249	0.0566	0.0683***
blue-collar worker	0.2023	0.4017	0	1	0.2841	0.1855	0.0987***
tenure	11.0585	10.7936	0	48.917	16.5449	9.9324	6.6126***
new job	0.1238	0.3294	0	1	0.0594	0.1370	-0.0776***
firm size							
self-employed w/o employees	0.0023	0.0474	0	1	0.0010	0.0025	-0.0015***
< 20	0.1995	0.3997	0	1	0.0531	0.2296	-0.1764***
[20, 200)	0.2427	0.4287	0	1	0.1738	0.2568	-0.0830***
[200, 2000)	0.2275	0.4192	0	1	0.2421	0.2245	0.0177***
≥ 2000	0.3281	0.4695	0	1	0.5300	0.2866	0.2434***
observations		22,678			3,424	19,254	
individuals		16,901			2,658	14,695	

Notes: This table shows summary statistics of the collective bargaining sample using individual-level weighting factors. Observation years are 2015 and 2019. In columns (1)–(4), we show statistics for the whole sample, in column (5) for trade union members, and in column (6) for non-members. Column (7) shows the difference in means between column (5) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A-4: Summary statistics of the co-determination sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All observations				Members	Non-members	Difference in the mean
	mean	s.d.	min	max	mean	mean	(col. 5 − col. 6)
life satisfaction	7.3465	1.5682	0	10	7.2873	7.3606	-0.0732**
TU member	0.1927	0.3944	0	1	1	0	
age	42.5477	11.7789	17	65	45.3293	41.8837	3.4457***
female	0.4506	0.4976	0	1	0.3420	0.4765	-0.1345***
married	0.5416	0.4983	0	1	0.5980	0.5282	0.0698***
education	12.5428	2.6601	7	18	12.2019	12.6242	-0.4224***
children in HH	0.4993	0.8418	0	8	0.4569	0.5094	-0.0525***
hours worked	38.5460	11.2822	1	80	39.6142	38.2910	1.3232***
public sector	0.2780	0.4480	0	1	0.3627	0.2578	0.1049***
civil servant	0.0731	0.2602	0	1	0.1296	0.0596	0.0700***
blue-collar worker	0.2661	0.4419	0	1	0.3748	0.2402	0.1346***
tenure	11.0489	10.5099	0	49.333	16.0030	9.8662	6.1368***
new job	0.1293	0.3355	0	1	0.0605	0.1464	-0.0887***
firm size							
< 20	0.1748	0.3798	0	1	0.0615	0.2018	-0.1403***
[20, 200)	0.2914	0.4544	0	1	0.2161	0.3094	-0.0933***
[200, 2000)	0.2409	0.4276	0	1	0.2623	0.2358	0.0265***
≥ 2000	0.2929	0.4551	0	1	0.4601	0.2530	0.2071***
observations	27,415				5,001	22,414	
individuals	22,024				4,141	18,522	

Notes: This table shows summary statistics of the co-determination sample using individual-level weighting factors. Following the sample restrictions of Table 5, self-employed and respondents working in firms with under five employees are excluded. Observation years are 2001, 2011, and 2019. In columns (1)–(4), we show statistics for the whole sample, in column (5) for trade union members, and in column (6) for non-members. Column (7) shows the difference in means between column (5) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A-5: Correlation between trade union membership and life satisfaction: Ordered Probit model

	(1)
Panel (A): Coefficients	
TU member	-0.0575***
	(0.0125)
Panel (B): Marginal effects	
satisfaction level:	
1	0.0005***
	(0.0001)
2	0.0004***
	(0.0001)
3	0.0010***
	(0.0002)
4	0.0020***
	(0.0005)
5	0.0026***
	(0.0006)
6	0.0066***
	(0.0015)
7	0.0048***
	(0.0010)
8	0.0043***
	(0.0009)
9	-0.0073***
	(0.0016)
10	-0.0092***
	(0.0020)
11	-0.0057***
	(0.0012)
observations	88,739
individuals	39,218

Notes: This table shows ordered probit regression results of the relationship between trade union membership and life satisfaction. The observation period is 1985–2019. Covariates are the same as in column (3) of Table 2. Individual fixed effects are not controlled for. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A-6: Correlation between trade union membership and life satisfaction (full table)

	(1)	(2)
	OLS	FE
TU member	-0.0966***	-0.0636**
	(0.0195)	(0.0252)
age	-0.0621***	-0.0279***
	(0.0042)	(0.0065)
agesq	0.0006***	0.0001**
	(0.0001)	(0.0001)
female	-0.0582***	
	(0.0176)	
married	0.3097***	0.1523***
	(0.0174)	(0.0257)
education	-0.0416	-0.0955
	(0.0260)	(0.0751)
educationsq	0.0026***	0.0039
	(0.0009)	(0.0027)
children in HH	-0.0048	-0.0154
	(0.0075)	(0.0103)
hours worked	-0.0032***	-0.0006
	(0.0006)	(0.0009)
tenure	0.0146***	-0.0009
	(0.0024)	(0.0029)
tenuresq	-0.0002***	-0.0001
	(0.0001)	(0.0001)
new job	-0.0530***	-0.0008
	(0.0202)	(0.0237)
public employee	-0.0204	0.0268
	(0.0225)	(0.0287)
civil servant	0.0616*	-0.0246
	(0.0358)	(0.0736)
blue collar worker	-0.2167***	-0.0925***
	(0.0187)	(0.0267)
firm size (*reference group:* < 20)		
self-employed w/o employees	-0.1800***	0.0193
	(0.0478)	(0.0557)
$[20, 200)$	0.0034	0.0358
	(0.0186)	(0.0240)
$[200, 2000)$	0.0390*	0.0905***
	(0.0211)	(0.0278)
≥ 2000	0.0709***	0.0989***
	(0.0212)	(0.0292)
industry fixed effects	X	X
year fixed effects	X	X
federal state fixed effects	X	X
observations	88,739	
individuals	39,218	

Notes: This table shows the relationship between trade union membership and life satisfaction. The observation period is from 1985 to 2019. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A-7: Trade union membership and life satisfaction: Cohort and Age

	(1) OLS	(2) FE	(3) OLS	(4) FE
Panel (A): Birth year				
	Born 1964 or earlier		Born after 1964	
TU member	-0.1396***	-0.0782**	0.0001	-0.0402
	(0.0261)	(0.0329)	(0.0281)	(0.0385)
observations	47,017		41,722	
individuals	17,710		21,508	
Panel (B): Age				
	Age 42 years and older		Younger than 42 years	
TU member	-0.1245***	-0.0309	-0.0560**	-0.0760**
	(0.0261)	(0.0393)	(0.0262)	(0.0376)
observations	45,367		43,372	
individuals	22,195		23,315	

Notes: This table shows the heterogeneous associations between trade union membership and life satisfaction by year of birth (Panel (A)) and age in the year of the interview (Panel (B)). The covariates are the same as in the specification (3) of Table 2. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A-8: Summary statistics of the potential channels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All observations				Members	Non-members	Difference in the mean
	mean	s.d.	min	max	mean	mean	(col. 5 − col. 6)
ln (wage)	7.4995	0.8613	0	11.5129	7.5760	7.4796	0.0964***
social capital	2.0588	0.4622	1	4	2.0600	2.0585	0.0015
job security	2.4024	0.6986	1	3	2.3094	2.4266	-0.1172***
economic concerns	2.1242	0.6819	1	3	2.0979	2.1311	-0.0332***
job satisfaction	7.1016	2.0312	0	10	7.0109	7.1252	-0.1143***
observations	73,151				14,406	58,745	
individuals	35,920				8,418	30,424	

Notes: This table shows the summary statistics of the potential channels between trade union membership and life satisfaction, i.e., the natural logarithm of the gross monthly wages, social capital, job security, economic concerns, and job satisfaction. The individual-level weighting factors are applied. The number of observations is 73,151. Except for 1989 and 1993, in which there are no observations for social capital, all the other sample years are included. In columns (1)–(4), we show statistics for the whole sample, in column (5) for trade union members, and in column (6) for non-members. Column (7) shows the difference in means between column (5) and (6). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A-9: Trade union membership and potential channels

	(1) Ln (wage)	(2) Social capital	(3) Job security	(4) Economic concerns	(5) Job satisfaction
Panel (A): OLS estimates					
TU member	0.0455***	0.0492***	-0.0583***	-0.0344***	-0.0994***
	(0.0058)	(0.0058)	(0.0080)	(0.0081)	(0.0250)
Panel (B): FE estimates					
TU member	0.0361***	0.0277***	-0.0443***	-0.0185	-0.0063
	(0.0090)	(0.0070)	(0.0133)	(0.0122)	(0.0395)
observations			73,151		
individuals			35,920		

Notes: This table shows how the natural logarithm of the gross monthly wage, social capital, job security, economic concerns, and job satisfaction are correlated with trade union membership. OLS estimates are depicted in Panel (A) and FE estimates in Panel (B). Except for 1989 and 1993, in which there are no observations for social capital, all the other sample years are included. The covariates are the same as in the specification (3) of Table 2. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A-10: Trade union membership and life satisfaction: Channel-specific samples

	(1)	(2)	(3)	(4)	(5)
Panel (A): OLS estimates					
TU member	-0.1055***	-0.1052***	-0.0666***	-0.0700***	-0.0594***
	(0.0194)	(0.0205)	(0.0191)	(0.0181)	(0.0166)
ln (wage)	0.1991***				
	(0.0115)				
social capital		0.4517***			
		(0.0169)			
job security			0.4791***		
			(0.0103)		
economic concerns				0.7676***	
				(0.0102)	
job satisfaction					0.3401***
					(0.0035)
Panel (B): FE estimates					
TU member	-0.0682***	-0.0763***	-0.0524**	-0.0600**	-0.0544**
	(0.0251)	(0.0291)	(0.0252)	(0.0246)	(0.0240)
ln (wage)	0.1119***				
	(0.0162)				
social capital		0.2120***			
		(0.0234)			
job security			0.303***		
			(0.0120)		
economic concerns				0.4836***	
				(0.0122)	
job satisfaction					0.2194***
					(0.0044)
Observations	88,739	76,947	86,609	88,415	86,277
Individuals	39,218	37,552	38,720	39,117	38,008

Notes: This table shows how the natural logarithm of the gross monthly wage, social capital, job security, economic concerns, and job satisfaction perform as channels between trade union membership and life satisfaction. OLS estimates are depicted in Panel (A) and FE estimates in Panel (B). Apart from the added channel variables, the covariates are the same as in the specification (3) of Table 2. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A-11: Correlation between trade union membership and life satisfaction with adjusted samples

	(1)	(2)	(3)
Panel (A): Bargaining agreement sample			
TU member	-0.0424	-0.0036	-0.0371
	(0.0310)	(0.0307)	(0.0320)
observations		22,678	
individuals		16,901	
Panel (B): Co-determination sample			
TU member	-0.0591**	-0.0276	-0.0582**
	(0.0260)	(0.0260)	(0.0271)
observations		27,415	
individuals		22,024	
control variables			
year/state fixed effects	X	X	X
demographic controls		X	X
labour market controls			X

Notes: This table shows the relationship between trade union membership and life satisfaction with adjusted samples using OLS models. The observation years are 2015 and 2019 for the collective bargaining sample in Panel (A) and 2001, 2011 and 2019 for the co-determination sample in Panel (B). The covariates are the same as in Table 2. In Panel (B), the variable indicating a firm size of less than 20 employees includes neither self-employed nor respondents working in establishments with fewer than 5 employees. Standard errors (clustered at the individual level) in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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