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Perceptions of Pay Satisfaction and Pay Justice: Two Sides of the Same Coin?

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Abstract

Individual perceptions of pay satisfaction and pay justice are closely related social indicators. Notwithstanding their apparent resemblance, there are essential theoretical differences between those two concepts. Yet, we know little if people merely consider pay satisfaction and pay justice as two sides of the same coin. This paper theorizes two situations in which people's perceptions of pay satisfaction and pay justice should differ in meaningful ways. First, their pay level should affect people's self-interest and thus have a stronger effect on their pay satisfaction than on pay justice. Second, pay inequality in the workplace should affect people morally and thus should have a stronger effect on their pay justice perception than on pay satisfaction. These hypotheses were tested with linked employer-employee data collected in Germany (N=2.695). Results of regression analyses with multiple dependent variables show that people's pay satisfaction and pay justice perceptions increased with the level of their individual pay and decreased with the degree of workplace inequality. The pay effect was significantly stronger on pay satisfaction than on pay justice while the workplace inequality effects did not differ significantly. These results suggest that people under specific circumstances differentiate between pay satisfaction and pay justice. Consequently, researchers should consider that their results and conclusions might differ if they analyze pay satisfaction instead of pay justice and vice versa.

Keywords Pay level · Pay inequality · Pay satisfaction · Pay justice · Germany

1 Introduction

Many classic and contemporary theories consider pay as a crucial driver of people's motivation at work (Gerhart & Fang, 2015; Rynes et al., 2004) and of their overall well-being (Bjälkebring & Peters, 2021; Stigler, 1972). However, pay effects differ between people and for many people pay increases their well-being only up to a certain threshold or vertex

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(Jebb et al., 2018; Kahneman & Deaton, 2010; Muresan et al., 2020). Beyond that, some researchers question the dominant focus on pay to explain people's motivation and well-being (Boyce et al., 2010; Roscigno et al., 2018; Stiglitz et al., 2018a; Valet et al., 2021). Instead, people's perceptions of pay satisfaction and pay justice could be much more consequential (Adriaans 2022; Currall et al., 2005; Narisada & Schieman, 2022). The momentum of pay satisfaction and pay justice research have caused many large-scale surveys to include questions about people's pay satisfaction as well as on their perceptions of pay justice. Yet so far, we know little if results and conclusions differ if researchers analyze pay satisfaction instead of pay justice or vice versa. One exceptions is a study of Scarpello & Carraher (2008) among self-employed business owners in Latvia, Germany, the UK, and the US. As they found no meaningful differences in their study, the authors concluded that we should not assume that people naturally differentiate between pay satisfaction and pay justice.

The idea of this paper is to revisit the claim that pay satisfaction and pay justice are merely two sides of the same coin. For this I investigate two independent variables which—at least from a theoretical perspective—should affect people's evaluations on pay satisfaction and on pay justice in different ways. First, I expect that higher individual pay is related to people's self-interest and, therefore, should have a stronger effect on their pay satisfaction than on their pay justice perception. Second, I expect that higher pay inequality in the workplace affects people morally and, therefore, should have a stronger effect on their pay justice perception than on their pay satisfaction. To test these hypotheses, I used German linked employer-employee data ($N=2,695$). The results of regression models with multiple dependent variables indicate that pay satisfaction and pay justice perceptions increased with the level of individual pay. As expected, the pay effect was significantly stronger on pay satisfaction than on pay justice. The workplace inequality effect was somewhat stronger for pay justice than for pay satisfaction but tests for differences in effects were statistically insignificant.

These results suggest that under specific circumstances people differentiate between pay satisfaction and pay justice. Consequently, researchers should refrain from assuming that pay satisfaction and pay justice are merely two sides of the same coin and consider that their results and conclusions might be different if they analyze pay satisfaction instead of pay justice and vice versa. Moreover, practitioners should continue to collect information on both social indicators in large-scale surveys.

2 Theoretical Background

To understand if pay satisfaction and pay justice are merely different in their theoretical conceptions or if people differentiate between satisfaction and justice of their pay, we must first take a closer look at the theoretical roots of both concepts. On this basis, we can theorize situations that should affect people's perceptions of pay satisfaction and pay justice in different ways.

2.1 Pay Satisfaction

Since the mid-20th century, pay satisfaction was subject to countless studies in economics, (social)psychology and sociology (Williams et al., 2006). The appeal to investigate people's

pay satisfaction is obvious. First, in micro-economic theory, pay is considered one of the integral drivers of employee motivation, work performance, and commitment (Gerhart & Fang, 2015; Rynes et al., 2004). At the same time, pay is one of the main expenditures for employers which they seek to keep as low as possible. Thus, a profound understanding of employee pay satisfaction is an essential source for employers' management strategies (Currall et al., 2005). Second, many scholars argue that economic theories' focus on pay levels is not sufficient to assess societal well-being (Easterlin, 1974; Stiglitz et al., 2018b). Among other things they call for a more nuanced focus on measures of individual well-being (Stiglitz et al., 2018a). Third, compared to other measures of individual well-being, pay satisfaction is relatively easy to conceptualize. Especially, subjective well-being (also called life satisfaction or happiness) but also job satisfaction are complicated multi-dimensional concepts (Maslow, 1970; Ormel et al., 1999; Spector, 1997). Therefore, it is quite difficult to investigate the effect of a specific determinant on these broader concepts. Narrowing the research focus greatly facilitates the identification of (causal) effects and (causal) mechanisms (Hedström & Ylikoski, 2010; Morgan & Winship, 2015). Instead of investigating overall well-being, we could look at only one sub-dimension of the broader concept. In our case here, job satisfaction is a sub-dimension of life satisfaction and pay satisfaction is a sub-dimension of job satisfaction.

In the literature, pay satisfaction is usually rooted in a concept of self-interest. Following classic economic theory, money can buy well-being, because it can be exchanged for goods that increase individual utility (Boyce et al., 2010; Rynes et al., 2004; Stigler, 1972). Theories on marginal diminishing utilities assume that an additional unit of pay yields more utility to those from lower pay brackets compared to those from higher pay brackets (Rynes et al., 2004; Stigler, 1972). Accordingly, pay increases individual well-being only up to a certain pay level. Beyond this threshold or vertex, more pay will not increase individual well-being anymore. Results for the US suggest that people's individual well-being on average does not increase beyond a yearly pay of about 75,000 to 95,000 Dollars (Kahneman & Deaton, 2010). Such pay thresholds were also found in many other countries and at different pay levels (Jebb et al., 2018; Muresan et al., 2020).

There is some debate in the literature if absolute pay or relative pay is more important for individual well-being (Boyce et al., 2010; Diener et al., 1993; Hauret & Williams, 2019). Easterlin (1974) was among the first to advance the relative argument. Reviewing his findings that increasing pay levels in a country did not increase overall happiness, he concluded people rely on others around them as a comparison standard to evaluate themselves. While everyone is better off if overall pay levels increase, the differences among those comparison standards remain unchanged. Proponents of the absolute pay hypothesis largely disagree with the relative pay hypothesis (Veenhoven, 1991). They argue that those who have more are more likely to fulfill their universal needs, such as food, housing, safety, health—and regardless of social comparisons or other changeable social standards. Yet, as soon as those universal needs are covered the relationship of pay and well-being diminishes (Diener et al., 1999; Ferrer-i-Carbonell, 2005; Hauret & Williams, 2019). This is again in line with the economic principle of the diminishing marginal utility of pay (Stigler, 1972) as well as with broader theories on subjective well-being such as Maslow's needs hierarchies (Maslow, 1970) or Lindenberg's theory on social production functions (Ormel et al., 1999). These theories assume that people seek to optimize different important domains of their lives. Put differently, optimization means for the life domain pay that as soon as people's pay level

reaches a certain threshold, they consider optimal, additional pay should not increase their overall well-being anymore.

2.2 Pay Justice

A closely related concept to pay satisfaction—and particularly to the relative argument—is the concept of pay justice. Research on pay justice perceptions is usually rooted in theories on morality (Rawls, 1971), referent standards (Major & Forcey, 1985), and social comparisons (Corcoran et al., 2011). Early studies conducted in the mid-20th century revealed that people's well-being is not primarily driven by their self-interest but by how benefits and burdens are distributed in a specific social context (Adams, 1965; Homans, 1958; Stouffer et al., 1949). When evaluating their pay, people do not solely look at their own pay level but also at the pay of others. Moreover, they take into account if the pay allocation process followed a distributional principle considered legitimate in the respective social context (Miller, 1999). As people view certain distributive rules as socially binding, they expect others to conform to these rules (Lengfeld, 2007). Most theories emphasize equality as the basic principle of justice. Equality of outcome per unit input (also known as equity principle), or equality below a minimum level (also known as need principle) are variations of this basic distributional principle (Deutsch, 1983; Liebig & Sauer, 2016; Miller, 1999; Rawls, 1971). Since the 1980s, empirical justice research witnessed momentum in various scientific disciplines and large-scale surveys increasingly included measures on pay justice. Again, there are at least three crucial appeals to research individual perceptions of pay justice: First, conceptions of social justice are part of a more general view of society and are shaped by experiences of individuals living in societies with specific histories, structures, and cultures (Skitka et al., 2010). Second, individual perceptions of pay injustice lead to attitudinal and behavioral reactions, such as counterproductive behavior at work (Greenberg, 1990), commitment (Clay-Warner et al., 2005; Roscigno et al., 2018) turnover intentions (Conlon et al., 2008), and impacts physical and mental health (Narisada, 2017; Schunck et al., 2015). Third, perceptions of pay justice, are as easy to measure as perceptions of pay satisfaction in large-scale surveys.

2.3 Situations in Which Pay Satisfaction and Pay Justice should Differ

If we compare the theoretical roots of the concepts of pay satisfaction and pay justice, we can theorize two situations that should affect perceptions of pay satisfaction and pay justice in different ways: (1) increasing pay level and (2) increasing pay inequality.

(1) Following the theoretical concept of self-interest, people should favor more pay to less pay. However, the idea of the marginal utility of pay as well as broader theories of subjective well-being assume diminishing returns to pay (Maslow, 1970; Ormel et al., 1999; Stigler, 1972). Pay justice perceptions should also increase with increasing individual pay, simply as people are more likely to consider their pay as less unjust as it increases. However, as pay justice is a moral judgment, the assumed relationship should not be as strict as for pay satisfaction: If people consider the wage allocation process as legitimate, they should consider even very low pay as just—while this pay might not be satisfying. In the same way, people should also consider very high and satisfying pay as unjust if they do not consider the pay allocation process as legitimate. Thus, my first hypothesis is:

H1: Increasing individual pay should on average have a stronger positive effect on pay satisfaction than on pay justice perceptions

(2) Following the theoretical concept of morality, people should consider pay inequality as legitimate if the underlying pay allocation process follows the dominant distributional norm. However, not all people consider the same pay allocation principles legitimate and socially binding in a specific social setting. Rather religious traditions, political cultures, and individual socialization teach people how to resolve conflicts over the allocation of benefits and burdens (Liebig & Sauer, 2016; Wegener & Liebig, 1995). Cross comparative studies indeed suggest that people from different countries and cultures favor different pay allocation principles and react differently to inequality (Rözer et al., 2022; Rözer & Kraaykamp, 2013). People from the US, for example, were more in favor of the equity principle whereas people from Europe were more in favor of the equality principle (Fischer & Smith, 2003; Gerlitz et al., 2012; Jasso & Meyersson Milgrom, 2008; Wegener & Liebig, 1995). As the data for this study was collected in Germany, greater inequality will likely conflict with people's dominant preference for equality. Increasing pay inequality should therefore decrease people's pay justice perceptions whereas their perceptions of pay satisfaction should be largely unaffected by the degree of pay inequality. Moreover, with increasing pay inequality, people are more likely to engage in social comparisons (the foundation of justice perceptions) and are thus more likely to detect that their pay differs from the pay of others. This would also be in line with the relative argument of the pay satisfaction literature (Ferrer-i-Carbonell & Ramos, 2014; Schneider, 2019). Accordingly, increasing pay inequality should also decrease individual pay satisfaction but not to the same extent as pay justice perceptions:

H2: Increasing pay inequality in the workplace should on average have a stronger negative effect on pay justice perceptions than on pay satisfaction

3 Data and Method

3.1 Data

To test these hypotheses, I used data from the German survey "Legitimation of Inequality over the Life-Span" (LINOS). The LINOS data set is particularly useful to test these hypotheses as it includes information on people's perceptions on pay satisfaction and pay justice as well as information on their pay level and measures of workplace pay inequality. LINOS survey respondents were sampled from official social security records of the German Federal Employment Agency (*Bundesagentur für Arbeit*). Since all employees in Germany who work at least on a marginal basis must contribute to the social security system, the sampling frame covers most employees in Germany.¹

LINOS was designed as a multimode study with self-assisted interviews and computer-assisted personal interviews (CAPIs). Respondents sampled in the self-assisted interviews

¹ Public sector civil servants (*Beamte*), self-employed, and marginally employed people are not subject to social security contributions and are thus not covered in the sampling frame.

could choose to complete the questionnaire either as paper-pencil interview (PAPI) or as web interview (CAWI). A professional survey institute conducted the fieldwork in the winter of 2012/13. In total 4,731 respondents completed the survey. The response rates, using AAPOR standards, were 12.7% for the PAPI/CAWI sample and 13.8% for the CAPI sample. Results of selectivity analyses revealed no idiosyncratic nonresponse patterns suggesting that the sample represents the target population quite well. Due to the sampling on social security records, the LINOS data allow data linkage to the Establishment History Panel and the data on Integrated Employment Biographies of the Institute of Employment Research. These data contain information on respondents' workplaces including company size and degree of workplace pay inequality. 2,862, or about two-thirds of the respondents agreed to the linking of their survey responses to the registry data.² Research on record linkage consent biases in the LINOS data found that people from the public sector were somewhat more likely to allow data linkage. Apart from this, no other meaningful record linkage biases were detected (Sakshaug et al., 2017). After deleting all respondents that did not consent to the data linkage or with missing values on any variable included in the empirical models, the analytic sample consists of 2,695 employees.

3.2 Measurement

Pay satisfaction was measured with the question: "How satisfied are you with your current income from employment?" Respondents could indicate their current pay satisfaction on an 11-point rating scale with labeled endpoints (0= "completely dissatisfied"; 10= "completely satisfied"). The average pay satisfaction in the sample was 5.81 with a standard deviation of 2.44. Pay justice was measured with the question: "Thinking about your current income from employment, would you say that it is just, unjustly too low or unjustly too high?" Respondents could indicate their pay justice on an 11-point scale with labeled endpoints and a labeled mid-point. The scale ranges from -5 (= "unjustly too low") over 0 (= "just") to +5 (= "unjustly too high"). Mean pay justice in the sample was -1.78 indicating people, on average, evaluated their current pay as somewhat lower than they would consider just.

The two focal independent variables are current pay in Euro and the degree of workplace inequality. Current pay was measured as the monthly gross. The question was: "How high is your monthly gross income from employment?" To make pay comparable across respondents with different weekly working hours, I transformed monthly pay into hourly pay. Respondents on average earned 18.43 Euro with a standard deviation of 10.05. Workplace inequality was measured by the Gini coefficient. The linked data allowed me to link the workplace inequality measured by the Gini coefficient to the survey data. The Gini coefficient ranges between 0 (=perfect equality) to 1 (=maximal possible inequality) and was computed on the daily gross pay of all employees in the respective workplace. To facilitate interpretation, I multiplied the Gini by 100 for the analyses. The mean Gini in the sample was 22.57. This is somewhat lower than what official sources measured for Germany in 2013 (about 29).³

² More information on the LINOS data can be found in the field report and codebook (Sauer et al., 2014; Valet et al., 2014).

³ Official sources look at overall pay inequality that also includes jobs that are not subject to social security contributions (many low paid jobs). Therefore, the different target populations can explain these differences in pay inequality.

Table 1 Descriptives

	Mean	SD	Min.	Max.
<i>Dependent variables:</i>				
Pay satisfaction	5.81	2.44	0	10
Pay justice	-1.78	1.82	-5	5
<i>Focal independent variables:</i>				
Pay in Euros (hourly)	18.43	10.05	5.03	115.4
Workplace inequality (Gini * 100)	22.57	11.36	0	73.8
<i>Control variables:</i>				
Gender (1 = female)	0.47	-	0	1
Age (years)	38.73	10.89	20	60
Education (years)	13.61	2.63	7	18
Working hours (weekly)	39.63	10.62	1	80
<i>EGP Class</i>				
Higher controllers (1 = yes)	0.13	-	0	1
Lower controllers (1 = yes)	0.29	-	0	1
Routine non-manual employee (1 = yes)	0.32	-	0	1
Manual supervisor (1 = yes)	0.00	-	0	1
Skilled worker (1 = yes)	0.14	-	0	1
Unskilled worker (1 = yes)	0.12	-	0	1
Company size	784.04	3,301.09	1	58,873
Observations	2,695			

Data: LINOS

To avoid potential biases of spurious correlations or antecedent suppression in the analyses, I included several control variables. I included only variables that precede and influence both—the focal dependent and the respective focal independent variable. In the language of modern causal analysis and directed acyclic graphs, I only controlled for variables that lie on an open backdoor path (Elwert & Winship, 2014; Rohrer, 2018). This approach explicitly avoids overcontrol biases introduced by the inclusion of mechanism variables (mediators) and hence does not strive to maximize the explained variance of the model (Huntington-Klein, 2022; Morgan & Winship, 2015). Crucial control variables that have distinct influences on current pay (and hence on workplace pay inequality) as well as on both perceptions of pay are gender (Auspurg et al., 2017; Valet, 2018), age (Schneider, 2016), education (Bjälkebring & Peters, 2021), working hours (Adriaans & Targa, 2022), EGP-class (Goedemé et al., 2022) and size of the company (Roscigno et al., 2018). Table 1 shows the mean, standard deviation, minimum, and maximum for all variables.

3.3 Analytic Approach

Both dependent variables are measured on categorical 11-point scales. Assuming cardinality of such scales makes little difference to assuming ordinality (Ferrer-i-Carbonell & Frijters, 2004). Therefore, I followed the lead of recent satisfaction (Schneider, 2019) and justice research (Schieman & Narisada, 2021) and estimated linear regressions. To investigate if pay satisfaction and pay justice are affected in different ways by the dependent variables, we must estimate models that allow testing coefficients across different models. Regression models with multiple dependent variables (such as multivariate regression models or seem-

Table 2 Multivariate regression of pay satisfaction and pay justice on hourly pay and controls

	(1)		(2)	
	Pay satisfaction (z-score)		Pay justice (z-score)	
	b	se	b	se
Pay in Euros (hourly)	0.084***	(0.005)	0.067***	(0.005)
Pay in Euros (hourly, squared)	-0.001***	(0.000)	-0.000***	(0.000)
<i>Control variables:</i>				
Gender (1 = female)	0.040	(0.039)	-0.113**	(0.042)
Age (years)	-0.014***	(0.002)	-0.012***	(0.002)
Education (years)	-0.022**	(0.008)	-0.030***	(0.009)
Working hours (weekly)	-0.001	(0.002)	-0.011***	(0.002)
EGP Class (Ref.: Higher controllers)	ref.		ref.	
Lower controllers (1 = yes)	-0.088	(0.059)	-0.068	(0.064)
Routine non-manual employee (1 = yes)	-0.073	(0.066)	-0.064	(0.071)
Manual supervisor (1 = yes)	-0.983	(0.617)	-0.551	(0.666)
Skilled worker (1 = yes)	-0.041	(0.077)	0.024	(0.083)
Unskilled worker (1 = yes)	-0.054	(0.082)	-0.049	(0.088)
Company size (in thousands)	0.010	(0.005)	0.002	(0.006)
Constant	-0.261	(0.171)	0.348	(0.185)
Observations	2,695		2,695	
R-squared	0.193		0.140	

Data: LINOS; dependent variables are z-transformed; standard errors in parentheses;

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

ingly unrelated regression models, Zellner 1962) are suited for this. Multivariate regression models are appropriate if the dependent variable differs across models, but the same independent variables are included in each model. The difference between classic ordinary least square regression and multivariate regression is the additional estimation of the between equation covariances in the latter. Therefore, multivariate regression models allow post-estimation statistical tests on differences in coefficients across different models.

To make the effects for pay satisfaction and pay justice directly comparable, I z-transformed them for the multivariate regression analyses. The *ceteris paribus* effects of the independent variables therefore display changes in standard deviations of the dependent variables as the respective independent variable increases by one unit. I additionally included the squared terms of hourly pay and workplace inequality to allow for possible nonlinear effects. To facilitate the interpretation of those nonlinear effects, I additionally plotted the predicted values of pay satisfaction and pay justice across different levels of pay and workplace inequality.

4 Results

4.1 The Effects of Pay on Pay Satisfaction and Pay Justice

Table 2 reports the results of the multivariate regression models of pay satisfaction and pay justice on hourly pay and the control variables. Model 1 shows the results for pay satisfaction and Model 2 the corresponding results for pay justice. Displayed are the coefficients

and standard errors in parentheses. If we first look at the effects of hourly pay on pay satisfaction, we see a positive and significant effect. This suggests that on average pay satisfaction increases as hourly pay increases. The negative and significant effect of the squared term of hourly pay points to a nonlinear and marginally decreasing positive effect of hourly pay on pay satisfaction. This means that an increase of one Euro in hourly pay has a larger effect among those with lower pay compared to those with higher pay. The effect of hourly pay on pay satisfaction decreases until it becomes zero (vertex) at an average hourly pay of 61.04 Euro. Beyond this point, any pay increase on average decreases pay satisfaction.

If we look at Model 2, we see that hourly pay also shows a positive and significant effect. Therefore, pay justice perceptions increase with increasing hourly pay as well. The squared term is also significant and negative, indicating a nonlinear and marginally decreasing positive effect. The vertex is at an hourly pay of 75.44 Euro.

If we compare the effect of hourly pay on pay satisfaction (Model 1) and pay justice (Model 2), we detect a somewhat larger effect of hourly pay on pay satisfaction than on pay justice. Due to the nonlinear nature of the effect, we can only test for differences of effect sizes at different values of hourly pay.⁴ For example, if hourly pay is five Euro, the effect of a one Euro hourly pay increase on pay satisfaction is 0.077. The corresponding effect on pay justice is 0.062. These effects differ significantly ($\chi^2 = 11.94$; $p < 0.001$). The difference in effect sizes is still significant for a one Euro increase if hourly pay is 20 Euro ($\chi^2 = 6.50$; $p = 0.011$) but only marginally significant if hourly pay is 25 Euro ($\chi^2 = 3.65$; $p = 0.056$). Beyond a pay level of 25 Euro, we detect no significant differences in the effect of a one Euro pay increase on pay satisfaction or life satisfaction.

The control variables show negative and significant effects for age and education on both dependent variables. Being female and weekly working hours, additionally, have negative and significant effects on pay justice. Yet, as the models are not set up to identify the causal effects of the control variables, those effects are not very meaningful.

Lastly, if we look at the model fit, measured by the R-squared, we detect values of 0.193 for the pay satisfaction model and 0.140 for the pay justice model. This means, the included variables explain about a fifth of the total variance of pay satisfaction and about a seventh of the total variance of pay justice.

To facilitate the interpretation of the crucial nonlinear effect of hourly pay, Fig. 1 displays the linear predictions of hourly pay on pay satisfaction (black dashed line) and pay justice (grey solid line) across different pay levels. If we look at lower pay levels, we see that the effect (slope) of a one Euro increase in hourly pay has a somewhat stronger effect (steeper slope) on pay satisfaction than on pay justice. Moreover, the vertex of the slope—at which an additional Euro in hourly pay does not increase individual well-being anymore—is at 61.04 Euro for pay satisfaction and at 75.44 Euro for pay justice. The difference between these vertexes is statistically significant ($\chi^2 = 6.81$; $p = 0.009$). These results are in line with the first hypothesis suggesting that individual pay has a stronger effect on pay satisfaction than on pay justice. Moreover, we can conclude that the marginal utility of an increase in pay level diminishes faster for pay satisfaction than for pay justice. This suggests people

⁴ The regression equation is (here we are only interested in the effect of hourly pay): $y = \beta_0 + \beta_1 * x_1 (\text{hourly pay}) + \beta_2 * x_1^2 (\text{hourly pay, squared}) + \dots + \epsilon$. The partial effect of x_1 (the first derivative with respect to x_1) hence is: $\frac{\partial y}{\partial x_1} = \beta_1 + 2\beta_2 * x_1$. The vertex (x_1^*) is calculated by rearranging and solving for x_1 : $x_1^* = \frac{-\beta_1}{2\beta_2}$

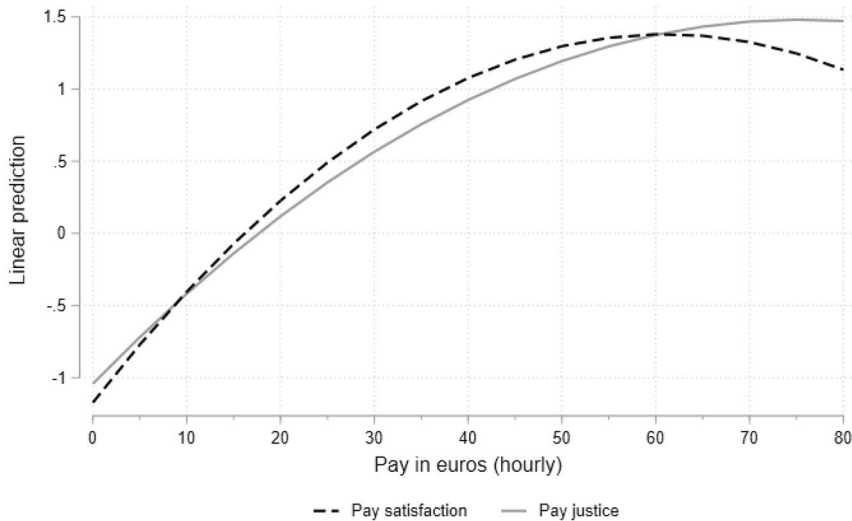


Fig. 1 Graph of pay effect in Table 2

are mostly satisfied with their pay if they reach a certain pay level, whereas they still might perceive high pay levels as unjust.

4.2 The Effects of Workplace Pay Inequality on Pay Satisfaction and Pay Justice

Table 3 reports the results of the multivariate regression models of pay satisfaction and pay justice on workplace pay inequality. Again, Model 1 shows the results for pay satisfaction and Model 2 the corresponding results for pay justice. If we first look at the effects of workplace inequality on pay satisfaction, we see a negative and significant effect. This suggests that on average pay satisfaction decreases as workplace inequality increases. The positive and significant effect of the squared term of workplace inequality indicates a nonlinear and marginally decreasing negative effect of workplace inequality on pay satisfaction. The vertex is at a Gini of 39.71.

In Model 2, we see that workplace pay inequality also decreases people's perceptions on pay justice. The squared term of workplace inequality is again positive and significant, indicating a nonlinear and marginally decreasing negative effect. The vertex is at a Gini of 34.56.

The comparison of the workplace inequality effects across model suggests that increasing workplace inequality has a somewhat stronger effect on pay justice than on pay satisfaction. This would be in line with our second hypotheses suggesting that workplace inequality has a stronger effect on pay justice than on pay satisfaction. However, if we test for effect differences across models, we find no significant differences across different workplace inequality levels. For a Gini of zero the effects of a one unit increase in workplace inequality are -0.024 for pay satisfaction and -0.026 for pay justice. These effects do not differ significantly from each other ($\chi^2 = 0.11$; $p = 0.743$). Indeed, we detect no significant dif-

Table 3 Multivariate regression of pay satisfaction and pay justice on workplace inequality and controls

	(1)		(2)	
	Pay satisfaction (z-score)		Pay justice (z-score)	
	b	se	b	se
Workplace inequality (Gini * 100)	-0.024***	(0.006)	-0.026***	(0.006)
Workplace inequality (Gini * 100, squared)	0.000**	(0.000)	0.000***	(0.000)
<i>Control variables:</i>				
Gender (1 = female)	-0.120**	(0.041)	-0.260***	(0.043)
Age (years)	-0.002	(0.002)	-0.001	(0.002)
Education (years)	0.030***	(0.008)	0.017	(0.009)
Working hours (weekly)	0.002	(0.002)	-0.007***	(0.002)
EGP Class (Ref.: Higher controllers)	ref.		ref.	
Lower controllers (1 = yes)	-0.185**	(0.063)	-0.164*	(0.066)
Routine non-manual employee (1 = yes)	-0.319***	(0.069)	-0.289***	(0.073)
Manual supervisor (1 = yes)	-1.453*	(0.656)	-0.986	(0.696)
Skilled worker (1 = yes)	-0.389***	(0.080)	-0.296***	(0.084)
Unskilled worker (1 = yes)	-0.499***	(0.083)	-0.456***	(0.088)
Company size (in thousands)	0.024***	(0.006)	0.014*	(0.006)
Constant	0.313	(0.192)	0.777***	(0.204)
Observations	2,695		2,695	
R-squared	0.086		0.060	

Data: LINOS; dependent variables are z-transformed; standard errors in parentheses;

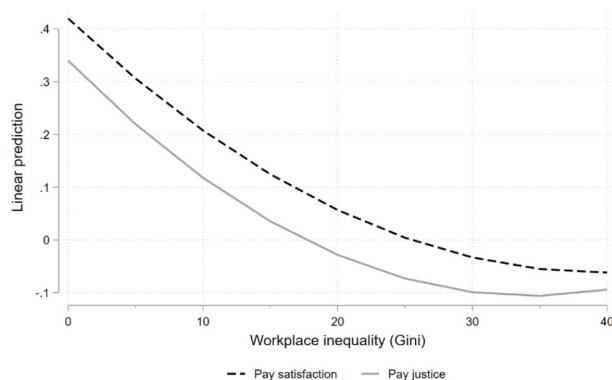
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

ference between the two effects across all possible levels of workplace inequality (0 to 100). Accordingly, we find no support for the second hypothesis.

The control variables show negative and significant effects for being female and all levels of subordinate EGP classes on both dependent variables. Company size shows a positive association with pay satisfaction and pay justice. Education is positively associated with pay satisfaction and weekly working hours have a negative effect on pay justice. Again, as the models are not set up to identify causal effects of the control variables, those effects are not very meaningful here.

Lastly, if we look at the R-squared, we detect values of 0.086 for the pay satisfaction model and 0.060 for the pay justice model. Comparing those R-squared measures to those in Table 2, we can conclude that workplace inequality explain much less of the variance in pay satisfaction and in pay justice than hourly pay.

If we look at the graphical display of linear prediction of workplace inequality on pay satisfaction (black dashed line) and pay justice (grey solid line) in Fig. 2, we see two largely parallel slopes. The predicted values of pay justice are generally below the predicted values of pay satisfaction. The vertex of pay justice is reached at a lower inequality level than the vertex of pay satisfaction. This indicates increasing workplace inequality in low inequality workplaces affects pay justice perceptions. If we look more closely on workplaces with a below average Gini (about less than 20), the slope of pay injustice indeed decreases slightly

Fig. 2 Graph of workplace inequality effect in Table 3**Table 4** Robustness checks with different transformations of the pay justice measure

	Pay justice (11-point measure, zscore)	Pay justice (transformed 6-point measures, z-scores)		
		Version 1	Version 2	Version 3
	b (se)	b (se)	b (se)	b (se)
Table 2:				
Pay in Euros (hourly)	0.067*** (0.005)	0.077*** (0.006)	0.072*** (0.005)	0.072*** (0.005)
Pay in Euros (hourly, squared)	-0.000*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Table 3:				
Workplace inequality (Gini * 100)	-0.026*** (0.006)	-0.020*** (0.006)	-0.024*** (0.006)	-0.021** (0.006)
Workplace inequality (Gini * 100, squared)	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)

Data: LINOS; dependent variables are z-transformed; standard errors in parentheses; control variables are included but not displayed; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

more than the slope of pay satisfaction. However, none of these differences are statistically significant.

4.3 Robustness Checks

As pay justice was measured on a scale ranging from -5 (= “unjustly underpaid”) over 0 (= “just”) to +5 (= “unjustly overpaid”), it could be argued that that the item-characteristic of this measure is not monotonic (e.g., +1 “= slightly unjustly overpaid” is not necessarily better than 0 “= justly paid”). Therefore, overpaid employees might bias results (Clay-Warner et al., 2016; Sauer & Valet, 2013). To make sure that the reported results are not driven by the characteristic of the justice measure, I performed robustness checks with different transformations of this measure: First, I deleted all overpaid respondents from the analyses (Version 1 in Table 4). Second, I re-categorized all overpaid respondents into the justly paid category (Version 2 in Table 4). Third, I only looked at the absolute values of the justice measure (i.e., +1 “= slightly overpaid” is considered the same as -1 “= slightly under-

paid”, Version 3 in Table 4). The resulting 6-point pay justice measures were each again z-transformed to allow direct comparison of the measures.

Table 4 shows that respective coefficients and standard errors of the focal independent variables for each of the transformed justice measures. The modelling proceeded in the same way as in Tables 2 and 3 and included the same control variables (the coefficients of the control variables are not displayed in Table 4). The re-estimation of the models with the transformed justice measures did not change the general results substantially. The coefficients were somewhat different, but the overall picture remained unchanged. Therefore, I conclude that the presented results are largely sound with respect to the measurement of pay justice.

5 Discussion and Conclusion

This paper set out to investigate if perceptions of pay satisfaction and pay justice merely differ in their theoretical conceptions or if people indeed perceive pay satisfaction and pay justice differently. For this, I theorized two situations in which people’s perceptions of these indicators should differ: First, I expected that increasing individual pay maximizes people’s self-interest and, therefore, should have a stronger effect on their evaluations on pay satisfaction than on their pay justice perceptions. Second, I expected that increasing earnings inequality in the workplace affects people morally and, therefore, should have a stronger effect on their pay justice perceptions than on pay satisfaction.

My results of multivariate regression models based on German linked employer-employee data from 2013 largely confirmed these expectations. The first set of empirical models on the effects of pay revealed people’s perceptions of pay satisfaction and pay justice increased with increasing pay levels. As expected, the effect of pay was significantly stronger on pay satisfaction than on pay justice. Moreover, and in line with previous literature (Jebb et al., 2018; Kahneman & Deaton, 2010; Muresan et al., 2020), I detected marginally diminishing returns: Pay satisfaction did not increase beyond an hourly pay level of about 61 Euro and pay justice did not increase beyond an hourly pay level of about 75 Euro. In line with the theoretical expectations, pay satisfaction seems to be more strongly related to people’s self-interest than pay justice. The second set of empirical models on the effects of workplace inequality revealed that pay satisfaction and pay justice decreased with increasing levels of workplace inequality. These relationships again were not linear. However, and in contrast to the theoretical expectations, the effect of workplace inequality was not significantly stronger on pay justice than on pay satisfaction.

One explanation for not finding the expected differences might be that not all kinds of inequality are considered illegitimate (Everett & Everett, 2015). In modern Western societies, most people expect people that are more productive should earn more than less productive people. Hence, people should consider pay inequalities that are due to differences in productivity as legitimate and these legitimate inequalities should not affect them morally. Only illegitimate inequalities (e.g., inequalities that are based on discrimination of lower status employees; Sauer et al., 2021) affect people morally. Future research should therefore focus more explicitly on disentangling perceptions of legitimate and illegitimate inequalities (Sauer et al., 2016). Apart from this, I must acknowledge some other limitations: Admittedly, the used data from 2013 is somewhat outdated. For example, the thresholds at which

more pay does not increase pay satisfaction or pay justice anymore are certainly higher nowadays. The evidence presented on specific monetary amounts is therefore not suited to guide policy planning. Yet, I assume that the focal evidence on differences in perceptions of pay satisfaction and pay justice should be stable over time. To confirm this assumption, we need replication studies with more recent data. Another concern might be my modelling approach which investigated pay satisfaction and pay justice perceptions as independent social indicators. Recent research, however, suggests that pay fairness is a crucial mediator that explains why pay inequality affects people's well-being in different ways (Ugur, 2021). Therefore pay justice could be a precondition for pay satisfaction (Adriaans 2022; Narisada & Schieman, 2022). Future research should take a closer look into these possible interdependencies of pay satisfaction and pay justice. And lastly, classic (Diener et al., 1993) and more recent (Hauret & Williams, 2019) research found relative pay as main driver of pay perceptions. Future research should disentangle if absolute and relative pay affect pay satisfaction (D'Ambrosio & Frick, 2012) and pay justice (Schneider & Valet, 2017) in different ways (Ball & Chernova, 2008).

Despite these shortcomings, I conclude that some of the evidence presented here is at odds with prior studies suggesting that we should not assume people naturally differentiating between pay satisfaction and pay justice (Scarpello & Carraher, 2008). At least under specific circumstances people do differentiate between pay satisfaction and pay justice. Therefore, researchers investigating pay perceptions should consider that their results and conclusion might differ if they analyze pay satisfaction instead of pay justice and vice versa. I end by emphasizing that we could only learn more about people's perceptions of closely related social indicators if we analyze them simultaneously. Therefore, I call for more research that derives sound theoretical expectations on why people perceive these indicators differently. For this, we need data. Therefore, practitioners must continue to collect information on closely related social indicators in large-scale surveys.

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