

**The Impact of Within and Between
Occupational Inequalities on People's
Justice Perceptions Towards their
Own Earnings**

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SFB 882 "From Heterogeneities to Inequalities"
University of Bielefeld
Faculty of Sociology
PO Box 100131
D-33501 Bielefeld
Germany
Phone: +49-(0)521-106-4942 or +49-(0)521-106-4613
Email: office.sfb882@uni-bielefeld.de
Web: <http://www.sfb882.uni-bielefeld.de/>

DFG Research Center (SFB) “From Heterogeneities to Inequalities”

Whether fat or thin, male or female, young or old – people are different. Alongside their physical features, they also differ in terms of nationality and ethnicity; in their cultural preferences, lifestyles, attitudes, orientations, and philosophies; in their competencies, qualifications, and traits; and in their professions. But how do such heterogeneities lead to social inequalities? What are the social mechanisms that underlie this process? These are the questions pursued by the DFG Research Center (Sonderforschungsbereich (SFB)) “From Heterogeneities to Inequalities” at Bielefeld University, which was approved by the German Research Foundation (DFG) as “SFB 882” on May 25, 2011.

In the social sciences, research on inequality is dispersed across different research fields such as education, the labor market, equality, migration, health, or gender. One goal of the SFB is to integrate these fields, searching for common mechanisms in the emergence of inequality that can be compiled into a typology. More than fifty senior and junior researchers and the Bielefeld University Library are involved in the SFB. Along with sociologists, it brings together scholars from the Bielefeld University faculties of Business Administration and Economics, Educational Science, Health Science, and Law, as well as from the German Institute for Economic Research (DIW) in Berlin and the University of Erlangen-Nuremberg. In addition to carrying out research, the SFB is concerned to nurture new academic talent, and therefore provides doctoral training in its own integrated Research Training Group. A data infrastructure project has also been launched to archive, prepare, and disseminate the data gathered.

Research Project A6 “The Legitimation of Inequalities – Structural Conditions of Justice Attitudes over the Life-span”

This project investigates (a) the conditions under which inequalities are perceived as problems of justice and (b) how embedment in different social contexts influences the formation of attitudes to justice across the life course.

We assume that individuals evaluate inequalities in terms of whether they consider them just, and that they hold particular attitudes toward justice because, and as long as, these help them to attain their fundamental goals and to solve, especially, the problems that arise through cooperation with other people (cooperative relations). As a result, attitudes on justice are not viewed either as rigidly stable orientations across the life span or as “Sunday best beliefs” i.e. short-lived opinions that are adjusted continuously to fit situational interests. Instead, they are regarded as being shaped by the opportunities for learning and making comparisons in different phases of the life course and different social contexts.

The goal of the project is to use longitudinal survey data to explain why individuals have particular notions of justice. The key aspect is taken to be changes in the social context – particularly households, social networks, or workplaces – in which individuals are embedded across their life course. This is because social contexts offer opportunities to make social comparisons and engage in social learning, processes that are decisive in the formation of particular attitudes to justice. The project will test this empirically by setting up a special longitudinal panel in which the same individuals will be interviewed three times over an 11-year period.

The results of the project will permit conclusions to be drawn on the consequences of changes in a society's social and economic structure for its members' ideas about justice. The project therefore supplements the analysis of the mechanisms that produce inequality, which is the focus of SFB 882 as a whole, by looking at subjective evaluations, and it complements that focus by addressing the mechanisms of attitude formation.

Research goals

- (1) Analysis of the conditions in which justice is used as a criterion for evaluating inequalities.
- (2) Explanation of attitudes toward justice as the outcome of comparison and learning processes mediated by the social context.
- (3) Longitudinal observation of the individual development of attitudes to justice over the life course.

Research design

- (1) Continuation and expansion of the longitudinal survey of evaluations of justice conducted by the German Socio-Economic Panel Study (SOEP).
- (2) Commencement of an independent longitudinal panel with ties to the process-generated individual data of the German Institute for Employment Research (IAB) and information on companies and households (the plan is to carry out three survey waves over an 11-year period).

The Authors

Carsten Sauer is a researcher in the SFB 882, project A6 at Bielefeld University. His research interests include the explanation of behavior, social inequality and justice and quantitative research methods (especially factorial surveys). Among his recent publications are “When Decisions Should Be Shared: A Study of Social Norms in Medical Decision Making Using a Factorial Survey Approach”. *Medical Decision Making* 33 (2013): 37-47 (with Meike Müller-Engelmann et al.). “The Application of Factorial Surveys in General Population Samples: The Effects of Respondent Age and Education on Response Times and Response Consistency.” In: *Survey Research Methods* 5 (2011): 89-102 (with Katrin Auspurg, Thomas Hinz, and Stefan Liebig).

Contact: carsten.sauer@uni-bielefeld.de

Peter Valet is a research assistant and lecturer at the Faculty of Sociology, Bielefeld University, a PhD candidate at the Bielefeld Graduate School in History and Sociology (BGHS), and a member of the SFB 882 research project A6. His research interests include justice perceptions of earnings, income satisfaction, and quantitative methods.

Contact: peter.valet@uni-bielefeld.de

Stefan Liebig is Professor of Sociology with a special focus on Social Inequality and Social Stratification at the Faculty of Sociology, Bielefeld University, and Principal Investigator of the Collaborative Research Centre (SFB) 882 research project A6, “The Legitimation of Inequalities - Structural Conditions of Justice Attitudes over the Life-span”. His research interests are empirical justice research, organizations and social inequality, and methods of empirical research. Recent publications are “The justice of earnings in dual-earner households.” In: *Research in Social Stratification and Mobility*. 30 (2012): 219-232 (with Carsten Sauer and Jürgen Schupp); “Gerechtigkeit” (2013) in: S. Mau & N.M. Schöneck (Eds), *Handwörterbuch zur Gesellschaft Deutschlands*, Springer VS, 286 – 299 (with Carsten Sauer and Peter Valet); “The Application of Factorial Surveys in General Population Samples: The Effects of Respondent Age and Education on Response Times and Response Consistency.” In: *Survey Research Methods* 5 (2011): 89-102 (with Carsten Sauer, Katrin Auspurg and Thomas Hinz).

The Impact of Within and Between Occupational Inequalities on People's Justice Perceptions Towards their Own Earnings

Carsten Sauer, Peter Valet, and Stefan Liebig

Collaborative Research Center (SFB) 882, Bielefeld University*

Abstract: This paper investigates justice perceptions of employees towards their own earnings. Earnings are decomposed into three components: (1) In returns based on human capital endowments, (2) in returns based on individual residual differences and (3) in returns based on differences between occupations. The legitimacy of these earnings components is measured via the justice assessments of employees. Based on theoretical models from justice research and class theory it is hypothesized that earnings inequality resulting from human capital factors is evaluated as just, whereas residual inequality and occupational inequality are perceived as unjust. The hypotheses are tested by using data from a German longitudinal panel study (SOEP) of the years 2005 to 2011. These data allow studying changes of individual earnings and justice evaluations in a household panel over the time span of six years (with four biennial measurement points). The findings support our hypotheses indicating that losses or gains in earnings which are due to changes in human capital endowments do not affect justice perceptions of own earnings. Losses or gains stemming from changes of a person's earnings position within the occupational group or the position of a person's occupational group within the earnings hierarchy of a society, however, affect justice perceptions remarkably. Thus, we can show that justice evaluations of own earnings do not solely depend on compensation for individual investments but also on residual differences in earnings within and between occupational groups.

Keywords: Earnings inequality, fairness of earnings, decomposition of justice evaluations, group identification, panel regression

* Collaborative Research Center (SFB) 882 – From Heterogeneities to Inequalities, Research Project A6 “The Legitimation of Inequalities – Structural Conditions of Justice Attitudes over the Life-span”, Bielefeld University, Faculty of Sociology, P.O. Box 100131, 33501 Bielefeld, Germany.
carsten.sauer@uni-bielefeld.de, peter.valet@uni-bielefeld.de, stefan.liebig@uni-bielefeld.de.

1. Introduction

Following Mouw and Kalleberg (2010) three types of earnings inequalities can at least be distinguished in modern societies: (1) Inequality due to individual differences in human capital endowments, (2) residual inequality within occupations—the share that is not due to individual differences in human capital, and (3) occupational inequality—differences in earnings between occupations that can for instance be attributed to specific processes of social closure. Studies on the relative proportions of these three components show that human capital characteristics have lost relevance (Gartner and Hinz 2009) while residual factors within occupations (Kim & Sakamoto 2008) and differences between occupations (Mouw and Kalleberg 2010) have become more important for explaining earnings inequalities over the last twenty years. Against this background the question of the present paper is whether these components of earnings inequalities affect employees' perceptions of justice towards their own earnings, or in other words we ask if individuals also take earnings inequalities that are not due to individual investments into account when they evaluate the fairness of their own earnings.

The most prominent justice theories in social psychology (equity theory by Adams 1965; Homans 1961) and economics (fair wage-effort hypothesis by Akerlof and Yellen 1990) solely focus on micro level processes that ignore the embeddedness of actors in the social structure. The general assumption of these approaches is that employees evaluate the fairness of their own earnings by comparing their individual efforts and rewards. Higher individual productivity or more human capital, thus, should lead to higher earnings (Adams 1965; Homans 1961; Walster, Walster, and Berscheid 1978). As there are no absolute returns for human capital, productivity or effort, employees have to assess the justice of their own earnings by comparing their own effort-reward ratio to the effort-reward ratio of others. Experiments referring to the concept of other regarding preferences (e.g., Bolton and Ockenfels 2000; Fehr and Schmidt 1999) also show that individual utility does not only depend on the absolute amount of own rewards but also on the rewards of other individuals. Hence, comparison processes are a fundamental part of the micro model of justice evaluations. The theories, nevertheless, give no hints with whom employees compare themselves, or in other words, what their reference standards are.

A theory that accounts for the structural embeddedness of individuals is the theory of relative deprivation by distinguishing individual and fraternal comparison processes. Accordingly, it is not only the individual's relative position within a group which is relevant for justice evaluations but also the relative position of the group itself. Relative deprivation theory, however, provides no clear definition of the relevant group for these comparison processes. Therefore, it is necessary to use a model that considers social boundary-making processes which predict the likelihood of potential comparison standards at both the individual level and the group level.

With regard to labor market earnings occupational groups are crucial for boundary-making and self-identification processes and these groups, furthermore, depict social structure and status groups. Likewise, the stratification of a society along occupational lines is mainly legitimized by composition effects, meaning that certain occupations require a higher level of human capital and, thus, pay higher average salaries than do others (Durkheim 2008 [1893];

Grusky 2005). So, the micro class approach could provide suggestions on relevant reference standards for comparisons within and between occupational groups.

The idea of this paper is to complement theories of justice that provide explanations on the micro-processes of justice evaluations on the intra-personal level with a structural model of social class to derive predictions regarding the comparison processes on which justice evaluations are based on. Furthermore, it transfers the theoretical decomposition of inequality-generating mechanisms to the field of justice research which focuses on inequality-legitimizing mechanisms.

Accordingly, this study empirically investigates whether individual perceptions of justice in earnings among employees are affected by the three distinguished earnings components (human capital, residual, and occupational) and how inequalities between and within occupational groups affect justice perceptions. We present results from longitudinal panel data provided by the German Socio-Economic Panel Study (SOEP) of the years 2005 to 2011. These data are unique in the world insofar as we are able to study changes in actual earnings and corresponding justice evaluations in a household panel over the time span of six years (with four biennial measurement points).

In the following sections we present the theoretical framework and derive hypotheses for subjective justice evaluations of own earnings. Then, the data and the methodological approach on the decomposition of earnings as well as the analytical methods are presented. Finally, the results are described and discussed in the context of the existing literature.

2. Earnings inequality

In the standard model of economics (the neoclassical model of a perfect market) individual earnings are determined by the labor supply of employees and the labor demand of employers. Due to restrictive assumptions regarding the homogeneity of work—e.g. that there are no preferences for certain exchange partners or that there are no institutional or cultural constraints—there are no synchronous differences in earnings among employees in this model. The human capital approach resolves the assumption of the homogeneity of workers and determines the level of earnings by the two employee-related factors education and work experience (Becker 1964). Earnings differentials arise from this perspective through the heterogeneity of workers in terms of education and work experience, meaning that higher education and work experience lead to higher earnings (Mincer 1974).

Recent studies on income inequality, however, show that the explanatory power of human capital variables has decreased significantly over the years while an increasing share of earnings differences is attributable to unobserved individual heterogeneity (Lemieux 2006; Mouw and Kalleberg 2010). This share of the pay gap that persists among people within the same occupation, of the same age and with the same education and work experience (also called residual inequality) yields different interpretations in the literature: The theory of skill-biased technological change (SBTC) posits that individuals have different abilities to adapt to technological innovations (Acemoglu 2002; Mouw and Kalleberg 2010), whereas, in gender studies this share is often argued to represent some sort of discrimination (Gartner and Hinz 2009).

Apart from these individual factors structural conditions also play a role in explaining differences in earnings. More complex economic and sociological labor market theories, such as the insider-outsider model, contract or efficiency wage theories also relax the assumption of the atomized individual and integrate institutional or cultural provisions in the explanatory models. They point out that certain institutional arrangements (such as collective bargaining or minimum wages) define the terms on which the product "manpower" can be traded. These provisions, thus, shift explanatory power of market mechanisms by dissolving the direct correlation between the marginal productivity of workers and their earnings so that actual earnings are no longer directly attributable to human capital factors. From the perspective of labor market theories, earnings differences between employees are related to differences in qualifications as well as to other individual factors and structural parameters (e.g., Ehrenberg and Smith 2006).

In sociology, occupational groups are considered to be a key component of social stratification. Advocates of the micro class approach posit that specific rent-generating mechanisms such as closure processes operate at the level of occupations and that these lead to differences in earnings between occupations (Grusky 2005; Weeden 2002; Weeden and Grusky 2005). The occupational group, furthermore, is argued to trigger identification processes and, thus, creates feelings of affiliations (Durkheim 2008 [1893]; Grusky 2005). There are, however, certain differences between occupationally mobile employees and employees who stay in a certain occupation for longer time periods exercising a stronger bond to their "micro class" (P. A. Berger 2013).

In sum, and following Mouw and Kalleberg (2010) at least three types of labor market-induced earnings inequalities can be distinguished: (1) Differences in human capital, (2) differences due to individual factors not related to human capital, and (3) structural inequality between occupational groups. Individual earnings can, hence, be decomposed into these three shares. The first two inequalities are related to individual earnings differences of employees within the same occupation, and the latter is the inequality that goes back to different earnings between occupations, e.g. caused by mechanisms of social closure.

3. Justice perceptions of own earnings

The subjective justice evaluation of a person's own earnings provides information on whether employees consider their individual earnings to be legitimate. The relevance of individual justice perceptions is underscored in numerous studies indicating that perceptions of illegitimate earnings lead to behavioral consequences such as shirking (George 1995; Liden, Wayne, Jaworski, and Bennett 2004), turnover intentions (Dailey and Kirk 1992), or to health-related consequences (Falk, Menrath, Verde, and Siegrist 2011; Tepper 2001).

Employees base justice evaluations regarding their own earnings on criteria relevant to them—mostly individual factors such as (1) social norms and (2) social comparisons (Liebig, Sauer, and Schupp 2012). Due to the incompleteness of the employment contract, the norm of reciprocity is central for evaluations of the exchange relation between employer and employee (Fong, Bowles, and Gintis 2004). This norm states that an individual effort should be compensated by an equivalent reward. Gouldner (1960) refers to this as heteromorphic reciprocity (Liebig et al. 2012). The early exchange theories consider the norm of reciprocity

as a universal rule that constitutes the normative framing of any social interaction. Adams (1965) and Homans (1961) assume that any actor in an exchange situation expects that any incurred investment is returned with a corresponding reward, meaning that higher investments should be associated with higher returns. Furthermore, not only current investments but also past investments, e.g. in education or work experience, are considered as relevant for the amount of individual reward (Mikula 2002). Subjective justice evaluations of individuals towards their own earnings can, therefore, be interpreted as adherence to an expected allocation entitlement and are, thus, directly related to the actual distribution of earnings in a society. In order to be aware of such an entitlement people have to rely on social comparison processes. The unsolved question, nevertheless, is with whom people compare themselves in order to evaluate own rewards?

The social structure can be regarded as a general device for solving individual decision problems. Certain structural elements within a society provide salient comparison standards for individuals. In his social comparison theory Festinger (1954) points out that other people—first and foremost people similar to oneself—play a central role in the formation of attitudes. Recent studies on the importance of different reference standards show that direct comparisons with colleagues and comparisons with people working in the same occupation are especially relevant for the evaluation of own earnings (Schneider and Schupp 2010). In regard to theoretically relevant comparison standards for the evaluation of earnings Goodman (1974) introduced a taxonomy of significant referents. This taxonomy distinguishes self, others, and the distributional system as possible reference standards. While exchange theoretical perspectives posit that comparisons with a specific person are most important for the formation of attitudes (Adams 1965; Homans 1961), status theoretical perspectives assume that a generalized other is the crucial reference point (J. Berger, Zelditch, Anderson, and Cohen 1972). Accordingly, people do not compare themselves with one specific other person but with an ideal typical image of another person with similar characteristics. This image includes people of the immediate work environment as well as former colleagues and the self in the past. Hence, both theoretical positions assume "lateral comparisons" (comparisons with similar people) to be crucial for the development of attitudes on just rewards. In these comparison processes the own reward or position is compared with the rewards or positions of relevant others. The results of these comparison processes then lead either to the perception that own rewards are just or unjust. Furthermore, a perception of injustice can either occur because own rewards are considered to be too low or because they are considered to be too high.

The theory of relative deprivation deals with individual reactions of people depending on their objective circumstances and their subjective comparisons (Walker and Smith 2002). The individual perception of a poorer position compared to a reference point is referred to as individual or egoistic relative deprivation (Crosby 1976). The counterpart of relative deprivation, i.e. the individual perception of a better position compared to a reference point is called relative gratification (Davis 1959; Runciman 1966).

In addition to perceptions of individual deprivation, relative deprivation theory is also concerned with perceptions of deprivation by individuals representing a group (Pettigrew 1967). This is referred to as fraternal, (Runciman 1966), group-related (Pettigrew and

Meertens 1995; Tyler and Smith 1995) or collective (Major 1994) deprivation. Here, a person compares the position of the own group with that of a reference group. The central factor in a perception of fraternal relative deprivation is “lateral solidarity,” a sense of affiliation to the members of the group (Taylor 2002).

Social identity theory (Hogg 2006; Hogg and Ridgeway 2003; Tajfel and Turner 1986) examines the causes of perceived group affiliations called in-group solidarity. Combined with research on relative deprivation in-group solidarity should be responsible for ensuring that the relative position of a person's own group in relation to other groups is relevant for individual justice evaluations. Fraternal deprivation refers to the perceptions that the average reward of the own group deviates from the average reward of an exogenous group. The theories, nevertheless, do not provide a theoretical concept to identify relevant comparison groups or reference standards.

This theoretical gap could be filled by applying the sociological micro class approach. Theories on social classes assume that inequalities are structured alongside the social stratification. The traditional class approach divides the society into a few big classes by either economical or status-related endowments. Despite more fundamental critique on the usefulness and the empirical relevance of social classes, proponents of a micro-class approach criticize that macro classes are nominalistic tools for scientists to investigate and explain social states and trends and have little impact on people’s everyday lives. Hence, it seems to be quite unrealistic that these macro classes are relevant for individual comparison processes. The micro class approach, in contrast, distinguishes smaller classes that are closer to the social reality people are living in. Advocates of the micro class approach posit that the level of occupations is an important level of social stratification which is also a salient level of social differentiation to individuals (Grusky 2005; Weeden 2002; Weeden and Grusky 2005). Thus, occupations are very likely to provide a structural framework in which social comparison processes take place. Occupational groups are, furthermore, especially relevant for the formation of identities (in Germany this is particularly relevant due to the dual system of education and vocational training). Earnings inequalities between occupations due to composition effects, e.g. higher proportions of individuals with more human capital in certain occupations (Lemieux 2006) are frequently regarded as legitimate (Durkheim 2008 [1893]; Grusky 2005). Apart from that, there are also differences in earnings of people with the same human capital endowments working in different occupations. In this case the mere membership of a person to a specific occupational group generates returns, e.g. due to specific closure processes that cease market mechanisms. Therefore, some occupational groups are able to retain a better market position i.e. higher returns which are not due to human capital endowments. In consequence these closure processes lead to an artificial shortage of skills or knowledge in some occupations, which transform them into scarce commodities. These processes, hence, allow members of the respective occupational group to gain higher returns for their human capital than employees with equal qualification in another occupation. Since, the returns achieved by closure processes are not related to individual efforts or skills they should not be considered as legitimate following individualistic exchange theoretical justice evaluation models such as equity theory.

In a nutshell, people may experience individual relative deprivation or gratification as well as relative fraternal deprivation and gratification. There is, nevertheless, no common understanding in the literature how individual deprivation and fraternal deprivation are interrelated (Pettigrew 2002). It is either assumed that they (1) are independent of each other, (2) interact with each other, or (3) mutually reinforce each other (spill-over effects).

4. Hypotheses

To generate hypotheses of how different kinds of earnings inequalities affect individual perceptions of justice we link the theoretical concepts on actual labor market inequality to the micro theories of justice.

If we follow Mouw and Kalleberg (2010) in their decomposition of inequalities each of the three components may also affect the evaluation of own earnings. Considering the micro justice model, earnings inequality due to human capital endowments should lead to the following predictions: According to equity theory people expect to be rewarded proportionally to their skills and qualifications. According to status-value theory people compare themselves with ideal-typical images of others with the same occupation and similar abilities when they evaluate the justice of their earnings. Because it is difficult to identify the actual input of a single worker especially in occupations with complex interdigitated tasks the human capital endowment is a good proxy for inputs. So, earnings differences which can be attributed to differences in human capital should be considered as just.

H1: Changes in earnings that are due to changes in human capital are considered as just.

Earnings differences which are not caused by human capital factors can be decomposed into two shares: Residual earnings inequalities within occupations and earnings inequalities between occupations. According to relative deprivation theory actual earnings inequalities that are not explained by human capital factors are in the case of negative deviations perceived as individual relative deprivation and in the case of positive deviations perceived as individual relative gratification. The distinction between deprivation and gratification—losses and gains—is necessary, as we know from literature that losses affect people more than do equivalent gains (Kahneman and Tversky 1979). Moreover, based on the theory of marginal utility (e.g., Stigler 1950) we have to assume that not all people will perceive individual relative deprivation as equally negative. Rather, loss of earnings is worse for people with a lower level of earnings than for people with a higher level of earnings. So, the interrelation between losses and changing fairness perceptions should not be linear.

H2a: Individual relative losses (irL) of earnings that are not due to human capital increase the perceived injustice of own earnings.

H2b: Perceived injustice of individual relative losses is larger for people with a lower level of earnings than for people with a higher level of earnings.

H2c: Individual relative gains (irG) of earnings that are not due to human capital decrease the perceived injustice of own earnings.

Differences in earnings between occupations that cannot be attributed to composition effects can trigger the perception of fraternal relative deprivation or gratification. As relates to justice evaluations of a person's own earnings individual as well as group-related negative deviations should be perceived as unjust whereas a relatively better position should reduce the perception of injustice.

H3a: Fraternal relative losses (frL) of earnings increase the perceived injustice of own earnings.

H3b: Fraternal relative gains (frG) of earnings decrease the perceived injustice of own earnings.

The fact that occupational groups are in Germany – due to the dual system of education and vocational training – especially relevant for the formation of identities combined with the idea that the duration employees stay in a certain occupation strengthens the bond to the respective occupation or micro-class, suggests that employees with low occupational mobility identify more strongly with their (occupational) class and, thus, are more likely to perceive differences in earnings between occupations as relevant for the justice evaluation of own earnings.

H4: Individuals with low occupational mobility (higher group identification) perceive fraternal relative losses (frL) of earnings as more unjust than those with high occupational mobility (lower group identification).

Additionally, the relationship between individual relative losses (irL) and group-based relative losses (frL) is not evident, yet. They could be independent of each other or mutually reinforce each other. In case of a reinforcing effect synchronous losses (within the group and between groups) would reinforce the perception of injustice.

H5: The synchronous experience of individual relative losses (irL) of earnings and fraternal relative losses (frL) of earnings reinforces the perception of injustice of own earnings.

5. Data, Variables, Methods

The data is provided by the Socio-Economic Panel Study (Schupp 2009; SOEP 2012; Wagner, Frick, and Schupp 2007). The SOEP is a representative longitudinal large scale survey study of private households and is administered by the German Institute for Economic Research (DIW) in Berlin. Every year the fieldwork organization TNS Infratest Sozialforschung surveys all members of approximately 11,000 households adding up to more than 20,000 individuals. The Panel was started in 1984 and covers a wide array of topics such

as household composition, occupational biographies, employment, earnings as well as health and satisfaction indicators.

We are using data from the years 2005 to 2011. Our sample covers employees, workers and civil servants (full-time, part-time or marginal employment) who provided information on their actual earnings as well as on their just earnings in at least two of the four years (2005, 2007, 2009 and 2011) the justice perception of own earnings was queried.

Justice perception of a person's own earnings

The dependent variable in our models is the subjective justice evaluation of a person's own earnings. The justice evaluation is a generated variable that consists of two measures: actual earnings and just earnings. Actual earnings are queried in the SOEP by the question: "How high was your income from employment last month? If you received extra income such as vacation pay or back pay, please do not include this. Please do include overtime pay." The response is measured on an open scale where respondents have to specify the amount of Euros they actually earn. The justice of own earnings is queried using two questions. First, it is ascertained by the following question: "Is the income that you earn at your current job just, from your point of view?" If the earned income is assessed as unjust respondents then have to specify an amount of Euros they would consider as just for themselves. The question on the justice of own earnings is asked biennially since 2005. We calculate the individual justice evaluation using the logarithmic ratio of actual and just earned income (Jasso 1978, 2007):

$$J = \ln\left(\frac{A}{C}\right) \quad (1)$$

J corresponds to the justice evaluation, A to the actual monthly earnings, and C to the earnings perceived as just. If respondents evaluate their earnings as just A equals C resulting in a justice evaluation of $J = \ln(1) = 0$. If the amount of just earnings is higher than the actual earnings the respondent feels underpaid (J -values are negative) and if the amount of actual earnings is higher than just earnings the respondent feels overpaid (J -values are positive).

Decomposition of earnings

According to Mincer (1974) earnings differences that are due to differences in human capital variables can be explained by two variables: Years of education and years of work experience. The unexplained residual which cannot be attributed to these human capital variables represents residual differences within occupations. Earnings differences between occupations are accounted for by the inclusion of aggregated occupations (or micro-classes).¹ The respective components are estimated simultaneously in a multilevel model:

¹ We operationalize the micro-classes as 54 aggregated occupations according to the definition of the German Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung, BiBB). The BiBB aggregates occupations according to the homogeneity of the main tasks employees have to fulfill in their respective occupations (Tiemann et al. 2008).

$$\ln y_{ijt} = \beta_{0t} + \beta_{1t} * EDU + \beta_{2t} * EXP + \beta_{3t} * EXP^2 + u_{0jt} + e_{ijt} \quad (2)$$

$\ln y$ corresponds to logarithmic gross hourly earnings, EDU is years of education, EXP years of work experience, and EXP^2 years of work experience squared. This component represents the classic Mincer earnings function. The subscript i is i -th individual, j is the j -th occupation and t is the t -th year 2005, 2007, 2009 or 2011. Therefore, we technically calculate four separate multi-level models (one for each observed year). The equation is decomposed into three parts.

First, the differences in earnings triggered by differences in human capital (Becker 1964; Mincer 1974)—in this model the fixed part of the regression including years of education, years of experience, and squared years of experience—are calculated. Due to the multi-level approach which controls for occupation on level two, differences in earnings between occupations do not interfere with individual level differences.

Second, residual inequality is measured by the individual error term e_{ijt} . Due to the separate estimation of the models for each year predicted values and residuals are determined separately for the years 2005, 2007, 2009, and 2011. If e_{ijt} is negative the residual is defined as individual relative loss (irL) and if positive as individual relative gain (irG). With this method the theoretically discussed reference point is measured empirically and deviations from this reference point are interpreted as individual losses or gains. Thus, this definition differs from other studies that usually measure deviations from individual earnings from the mean of an individual's own occupational or status group (while relevant information is, thus, not included in the measure such as that comparisons are usually made between people who are similar in various characteristics such as similar occupations, work experience and education).

Third, occupational inequality is measured by the random intercept u_{0jt} . This measure is uncorrelated with human capital factors and therefore not a measure for composition effects but for rent generating mechanisms at the occupational level (e.g., social closure). Negative deviations from the mean measure the extent of fraternal relative losses (frL) – mean earnings of an individual's own occupational group are less than mean earnings of all employees – and positive deviations measure the extent fraternal relative gratification (frG).

Occupational mobility

Occupational (im)mobility as proxy for high (low) identification with the occupational group is determined as a dichotomous indicator. It is based on the survey years from 2002 to 2011. If a respondent reported a job change to another occupational group in the last three years or entered the job market for the first time in this period the variable is coded with a 1 , otherwise with 0 . Hence, this indicator tracks back an equal number of years to the past from each survey year 2005, 2007, 2009, or 2011.

Control variables

Additionally to the different earnings components several control variables are included in the models: Individual tax and social security expenditures,² overtime hours per week, full-time employment, age and age squared as well as period dummies (survey years).

Methods

To test our hypotheses we estimate fixed-effects panel models.³ These regressions only estimate changes within survey units (changes at the individual level over time and no level differences between respondents) and thus rule out bias by time invariant unobserved heterogeneity (Cameron and Trivedi 2005). Changes in the justice perception of a person's own earnings are estimated by the following regression approach (Allison 2009; Cameron and Trivedi 2005),

$$(y_{it} - \bar{y}_i) = \beta(x_{it} - \bar{x}_i) + (e_{it} - \bar{e}_i) \quad (3)$$

The matrix \mathbf{x} includes all time variant covariates; additionally the idiosyncratic error term is attached. Robust standard errors (Huber clustering) are estimated (Arellano 2003; Wooldridge 2009) to adjust for heterogeneous standard errors.

6. Results

First, we investigate whether the influence of the three inequality generating components on earnings changes over the observed time period. Therefore, the logarithm of gross hourly wages is regressed on the three earnings components for each year of survey. Figure 1 shows the changes of explanatory power (changes of partial R^2 in percent) of the human capital factors (dashed line), residual characteristics (dotted line) and occupational membership (solid line) for each observed year. There is a tendency over the time span of six years that human capital factors lose ground—about seven percent between 2005 and 2011—and inequality based on occupational membership increases—about eleven percent in the same time. The explanatory power of residual characteristics of individuals does not change much over time. So, in the data at hand we find changes of the two components human capital and occupation.⁴

² Taxes and social security expenditures are operationalized as the ratio of gross earnings to net earnings.

³ The data are analyzed with the statistical software *Stata* (StataCorp 2011). Tables are computed with the user-written *Stata*-program *estout* (Jann 2005, 2007). Figures are computed using *scheme_lean* (Juul 2003).

⁴ Table A1 in the Appendix additionally shows how the three factors contribute to the overall inequality. On average almost 30 percent of the variance can be explained by human capital. Almost 10 percent go back to occupational membership which is not explained by composition effects. The residual factors are the unexplained component on the individual level with a share of more than 60 percent.

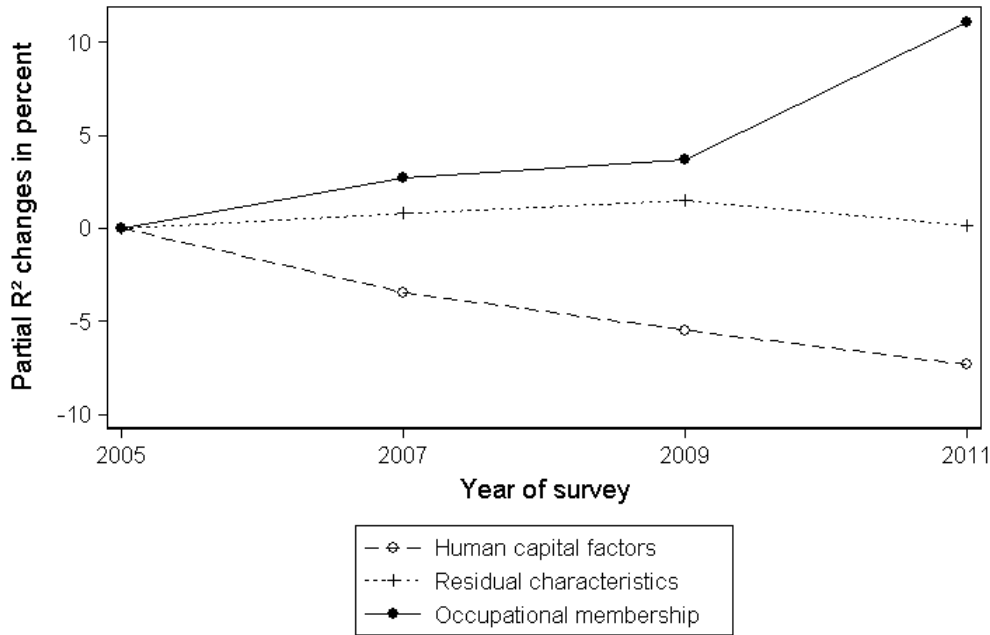


Figure 1: Changes in partial explained variance (R^2) in percent by the inequality generating components human capital, residual characteristics and occupational membership plotted for the four measurement points 2005, 2007, 2009 and 2011. The graph shows that human capital factors (dashed line) have a decreasing explanatory power over the years. The explanatory power of occupational membership (solid line) increases, whereas residual characteristics (dotted line) have a quite constant impact. Data: SOEP v28, 2005-2011, weighted.

Table 1 reports the perceived legitimacy of changing inequalities in three fixed-effects models regressing changes in the subjective justice evaluation of earnings on human-capital-related and individual-residual changes in earnings and control variables. The first model tests the perceived legitimacy of the changes in earnings due to human capital (hypothesis 1). In the second model the main effects of changes in residual earnings within occupations (hypotheses 2a and 2c) are tested. In the third model we test the interaction between changes of a person's own earnings and the person-specific mean earnings (hypothesis 2b).

Model 1 shows that the effect of the earnings component which is attributed to changes of human capital factors is statistically insignificant. So, changes in earnings that are due to changes in human capital endowments are perceived as legitimate and do not affect the justice perception of own earnings. This means that if people earn more because of increasing education or work experience they do not evaluate this surplus as more just in comparison to their previous earnings. This finding is in line with equity theory and status value theory which assume that productivity is a legitimate criterion for inequality. Hypothesis 1, thus, can be confirmed.

Model 2 shows that individual relative losses (irL) have a significant negative effect on the subjective justice perception of own earnings. The effect supports the assumed influence that a negative deviation of individual earnings from the individual reference point is perceived as unjust. Model 2 also shows that relative gains of an individual (irG) lead to an evaluation of own earnings as more just. This relationship corresponds to hypotheses 2a and 2c. The F-test in the table footer reports whether the negative effect of gains corresponds to the effect of losses. The test is whether the positive effect of relative gains on the justice perception of own earnings is equal to the negative effect of relative losses. The test shows

that losses have a much stronger influence on the justice evaluation than gains confirming the hypothesis on loss aversion.

Model 3 tests whether losses in earnings are equally important for the justice evaluation of all respondents or whether there are differences depending on the level of mean earnings as would be predicted by marginal utility theory. Therefore, the within effect is multiplied by the between effect. This interaction effect is significant and shows that losses are perceived as more unjust by those employees who have lower mean earnings confirming hypothesis 2b.

The control variables show the following effects: An increase of taxes and social security expenditures increase the perception of injustice. An increase in overtime hours per week increases the perception of injustice as well. A change to full-time employment does not affect the justice evaluation. The age effect is only significant in model 2 and model 3 and shows a negatively u-shaped relationship.

Table 1: Fixed effects regression of the justice evaluation of earnings on human-capital-related and residual changes in earnings

	(1)		(2)		(3)	
<i>Human capital component of earnings</i>						
Human capital factors	.020	(.073)	.079	(.070)	.083	(.070)
<i>Individual residual component of earnings</i>						
Ind. relative losses (irL)			-.239 ^{***}	(.020)	-.147 ^{***}	(.030)
Ind. relative gains (irG)			.077 ^{***}	(.012)	.089 ^{***}	(.012)
<i>Level of individual Earnings</i>						
irL * ind. level of earnings					-.147 [*]	(.062)
<i>Control variables</i>						
Taxes and social security contributions	-.062 ^{***}	(.017)	-.166 ^{***}	(.020)	-.165 ^{***}	(.020)
Overtime hours (per week)	-.002 ^{***}	(.001)	-.002 [*]	(.001)	-.002 [*]	(.001)
Full-time employment	.019	(.010)	-.012	(.010)	-.009	(.010)
Age	-.005	(.006)	-.016 [*]	(.006)	-.015 [*]	(.006)
Age squared	.001	(.001)	.001 [*]	(.001)	.001 [*]	(.001)
Constant	-.036	(.086)	.164	(.085)	.135	(.083)
R ² within	.012		.063		.066	
Observations	35035		35035		35035	
Respondents	16231		16231		16231	
F-test: irL + irG = 0			39.952 ^{***}			

* p<0.05, ** p<0.01, *** p<0.001; robust standard errors in parentheses; controlled for period dummies (year of interview). Data: SOEP v28, 2005-2011.

Table 2 shows three models that investigate different aspects of the fraternal or group-related component of earnings. The first model tests whether changes in the earnings component – that are attributable to the mere membership to an occupational group—have an impact on the justice evaluation of an individual's own earnings. The coefficients of the first model indicate that relative losses of the occupational group in relation to the grand mean of all employees have a negative effect on the justice perception of a person's own earnings. This is in line with hypothesis 3a. Furthermore, the effect of relative gains of the occupational group is positive indicating that respondents who experience relative gains of their occupational group perceive their earnings as just. Thus, hypothesis 3b can also be confirmed.

The second model tests whether respondents with high group identification differ in their perception of group-related losses from those with low group identification. It is assumed that group losses are not relevant to the same extent for people who recently changed occupations compared with those who have worked in the same occupation for a longer period of time.

The interaction models test whether individuals with high occupational mobility (proxy for low occupational identification) differ in their justice evaluations of their own earnings—in the case of group related losses—from people with low occupational mobility (proxy for high occupational identification). The coefficient for those with high identification is significantly negative and larger than for people with low identification. The effect, therefore, shows that for people with high occupational identification the status of their own occupational group plays a significant role in determining the justice of own earnings. The effect for people with high mobility is also negative but remarkably smaller and insignificant. The group-related component of earnings seems to play a much smaller role for the justice evaluation of own earnings for those with low occupational identification. The test for differences in the coefficients in the footer of the table is, however, insignificant. Therefore, hypothesis 4 cannot be confirmed.

Finally, the third model tests whether individual and group-related relative losses lead to a reinforcing effect (hypothesis 5). The interaction effect of individual relative losses and group-related relative losses is negative and significant, indicating that people who experience earnings losses on both components perceive their earnings as less just. Thus, hypothesis 5 can be confirmed. The control variables show the same effects as in Table 2.

Table 2: Fixed effects regression of the justice evaluation of earnings on occupational-related changes in earnings and interactions, group identity, and reinforcement of individual and fraternal losses

	(1)		(2)		(3)	
<i>Human capital component of earnings</i>						
Human capital factors	.068	(.071)	.068	(.071)	.078	(.070)
<i>Individual residual component of earnings</i>						
Ind. relative losses (irL)	-.251 ^{***}	(.021)	-.251 ^{***}	(.021)	-.255 ^{***}	(.021)
Ind. relative gains (irG)	.096 ^{***}	(.013)	.097 ^{***}	(.013)	.091 ^{***}	(.013)
<i>Occupational component of earnings</i>						
Occ. relative losses (frL)	-.143 ^{***}	(.039)			-.148 ^{***}	(.040)
Occ. relative gains (frG)	.123 ^{***}	(.027)	.123 ^{***}	(.027)	.111 ^{***}	(.028)
<i>Interaction with occupational identification</i>						
frL * high occupational identification			-.152 ^{***}	(.039)		
frL * low occupational identification			-.047	(.086)		
<i>Reinforcement of individual and fraternal losses</i>						
irL * frL					-.370 ^{**}	(.131)
<i>Control variables</i>						
Taxes and social security contributions	-.178 ^{***}	(.020)	-.178 ^{***}	(.020)	-.176 ^{***}	(.020)
Overtime hours (per week)	-.001 [*]	(.001)	-.001 [*]	(.001)	-.001 [*]	(.001)
Full-time employment	-.017	(.010)	-.017	(.010)	-.017	(.010)
Age	-.016 ^{**}	(.006)	-.016 ^{**}	(.006)	-.017 ^{**}	(.006)
Age squared	.002 [*]	(.001)	.002 [*]	(.001)	.002 [*]	(.001)
Constant	.218 [*]	(.086)	.219 [*]	(.086)	.205 [*]	(.086)
R ² within	.066		.066		.069	
Observations	35035		35035		35035	
Respondents	16231		16231		16231	
F-test: frL*high occ. id. = frL * low occ. id..			1.714			

* p<0.05, ** p<0.01, *** p<0.001; robust standard errors in parentheses; controlled for period dummies (year of interview); residual centered interactions; occ.id. = occupational identification. Data: SOEP v28, 2005-2011.

7. Discussion

The aim of this paper was to investigate the importance of three types of earnings inequalities for the justice perception of earnings by extending the standard (micro-)model of justice evaluation with a structural concept from class theory. As the standard (micro-)model relies solely on comparison processes at the individual level it provides no theoretical proposition on comparison standards. It, therefore, neglects the structural conditions of comparison processes related to the embeddedness of individuals in a system of stratification and ignores the fact that social structures provide opportunities to solve the individual problem of choosing the “right” reference standard. The relative deprivation theory points to the importance of the group level. Accordingly, individual standing within a group and group standing in comparison to other groups both play crucial roles in justice evaluation processes. The theory, nevertheless, does not provide an explanation on how to determine important or salient comparison standards. Therefore, a model is needed that predicts which referents are relevant for comparison processes. Hence, we complement the traditional models of justice with the structural theory of social classes which enables us to determine salient comparison standards. The micro-class approach is useful to come to these relevant social groups because it is orientated on the experience of people in a society, i.e. on real boundaries. Occupations define structural conditions in which comparison processes with regard to labor market outcomes are likely to be made. They provide a referential structure as a scheme of orientation for employees to judge whether their earnings are just. And these comparison processes do not only focus on the individual standing of employees in the earnings hierarchy in their respective occupation but also on the relative position of their occupations in comparison to other occupations. Thus, it becomes clear that not only micro justice but also macro justice—in regard to the distribution of earnings within societies—plays a crucial role in justice evaluation processes.

To investigate how individual and structural components are interrelated in justice evaluation processes actual earnings were decomposed into three components: individual differences in earnings that can be attributed to human capital factors, residual differences in earnings within an occupation that are not due to human capital factors, and fraternal differences in earnings that are based on the mere membership to an occupation. The estimated fixed-effects regression models only consider changes in relative gains or relative losses of the respective components to explain changes in the subjective justice perception of an individual's own earnings. Thus, this study investigated the perceived legitimacy of inequality-generating mechanisms.

The results show that inequality based on human capital factors seems to be legitimate as gains and losses based on human capital factors do not change the justice perception of own earnings. This indicates that inequalities based on human capital factors are widely legitimated in the (German) society. Considering findings of recent studies that show a declining influence of human capital factors on earnings, this suggests that people will evaluate their earnings as more and more unjust in the future if this trend persists.

The justice evaluation of own earnings is, however, influenced if people experience relative losses or gains both at the individual and at the group-level of occupations. On the individual level this means that changes in earnings that do not stem from human capital

factors have a strong impact on subjective justice evaluations. Additionally, the results show that relative losses are perceived as more unjust among respondents with a lower level of earnings, confirming the assumed marginal utility of economic theory. Moreover, the results indicate that individual relative losses in earnings affect the perceived justice of own earnings more strongly than individual relative gains confirming the hypothesis on loss aversion.

On the group level of occupations losses and gains of the own occupational group compared to the grand mean also has a remarkable effect on the justice perception of own earnings. This indicates that the embeddedness of individuals in social groups also plays a crucial role in the justice evaluation process. The hypothesis that differences in earnings between occupations are especially relevant to people with a higher occupational identification, nevertheless, could not be confirmed. The effects, however, showed the assumed relation but did not differ significantly. This may be due to the measurement of the concept "occupational identity" as related to job changes between occupations in recent years. Other measures on job-related attitudes that capture occupational identification would be necessary to gain better insights.

In sum, this study implies that in the context of changing earnings inequality people perceive the legitimacy of the investigated inequality-generating mechanisms differently. Changes in returns based on human capital factors—that according to equity theory are productivity-related input factors—did not affect the justice evaluation of an individual's own earnings and, thus, are deemed to be legitimate. In contrast to this individual differences in earnings that are not explained by human capital factors are relevant to justice evaluations. Given the background that this residual component is growing, a decline in the perceived legitimacy of this component of earnings inequality could be expected. Differences between occupations under control of composition effects were also relevant for individual justice perceptions and, thus, are also not considered as legitimate. This indicates that inequality-generating mechanisms like social closure—on the level of occupations— are not perceived as inequality-legitimizing mechanisms. Thus, inequalities that supposedly stem from social processes like discrimination or social closure influence the justice evaluations of a person's own earnings. Considering the results of previous studies showing that perceptions of injustice of own earnings trigger various behavioral and health-related consequences it could be of interest to investigate how much the different earnings components analyzed in this study contribute to these consequences.

8. Literature

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9. Appendix

Table A1: Different components of actual gross earnings by year in percent

Year	Partial R ²			Total
	Human Capital	Residual Factors	Occupation	
2005	28.09	63.25	8.80	~ 100
2007	27.12	63.77	9.04	~ 100
2009	26.55	64.23	9.14	~ 100
2011	26.03	63.35	9.90	~ 100

Partial R² which add up to 100 percent for each wave, differences to 100 due to rounding errors.
Data: SOEP v28, 2005-2011, weighted.

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