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How Others' Earnings influence our Justice Perceptions.

Studying the Effects of Income Distribution and Social Position on Reflexive Justice Evaluations among German Employees

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Hawal Shamon

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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

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How Others' Earnings influence our Justice Perceptions. Studying the Effects of Income Distribution and Social Position on Reflexive Justice Evaluations among German Employee

Simone Schneider, Hawal Shamon

Abstract:

While it is generally agreed that individuals compare themselves with others when assessing their earnings, little is known about the duality/interaction of contextual and individual forces with regard to justice evaluations. This study combines a proposition of judgment theory, i.e. range-frequency theory, with sociological justice theories and examines, in an organizational setting, whether employees base their justice evaluation of their own earnings on the income distribution they are surrounded by and/or their personal ranking within the income hierarchy. It argues that both the range of incomes in the organization as well as the person's ranking influence how a person evaluates their income. The empirical analysis is based on 636 full-time and part-time employees in Germany who participated in a factorial survey that was integrated into a larger representative survey study of German employees. Respondents were asked to evaluate their income after they were given information on the incomes of others and their personal position/rank in the income hierarchy. In line with the theoretical reasoning, this paper finds that employees base their justice evaluations on both range and rank. It finds the effects to be equally strong and both effects add to each other in terms of absolute values.

Keywords:

Income Justice; Income Inequality; Social Position; Factorial Survey; Experiment;

Introduction

> *The sentiment of distributive justice bridges the gap between individualistic and collectivistic explanation; for it is experienced by the individual and measureable in the individual but, unlike hunger or thirst or fatigue, cannot even occur except by reference to the distribution of a good among a collection of humans (Jasso 1980, 29).*

Social context is fundamentally relevant to a person's justice perception and raises two kinds of questions: firstly, how does a macro-phenomenon, like the distribution of income, translate into a micro-phenomenon such as an individual's value judgment? Secondly, which aspects of the social context, i.e. types and patterns of income distributions, does the individual perceive as being relevant for basing his/her value judgment on? Answers to these questions allow a more accurate prediction of justice evaluations which have a profound effect on a person's productivity, job performance and outcomes (Janssen et al. 2010; Sauer and Valet 2013; Simons and Roberson 2003), organizational commitment (Loi et al. 2006), physical health (Markovsky 1988; Schunk et al. 2013) and psychological well-being (Alwin 1987; Fields et al. 2000; Tremblay et al. 2000; Younts and Mueller 2001).

The first question has attracted much attention during the past decades pointing to social comparisons as the fundamental mechanism that translates characteristics of the social context into individual experiences. Festinger (1954) posits a fundamental "drive" in humans to evaluate their opinions and abilities. He proposes that "to the extent that objective, non-social means are not available, people evaluate their opinions and abilities by comparison respectively with the opinions and abilities of others" (Festinger, 1954, 118). In her early work, Jasso (1990, as cited in Jasso 2006) called this human drive a "comparison force". A number of theories in social psychology have developed these propositions further, treating social comparisons as universal processes of the human mind that should, by definition, apply to every human being.

Less attention has been paid to the second question and the importance of the income structure within the reference group. Given the relevance of other people's incomes in the evaluation of incomes, it is surprising that theoretical advances in justice theory have been limited, largely attributing theoretical and empirical relevance to the average income of a reference standard without considering the larger distribution of incomes among the group members of the relevant reference group. The proposition is usually straightforward: the higher (or lower) the income of the individual when compared to the mean of a comparison standard, the more positive (or negative) his/her income evaluation is. However, this tradition/assumption leaves out other important information on the distribution of

incomes within the reference group. It ignores the fact that it is not only the mean but other characteristics of the income distribution, such as the range of incomes or the individual's position within the income hierarchy (rank) that may be equally important to an individual's value judgment.

This study aims to fill this gap and asks whether the distribution of incomes at the workplace plays a role in the perception of just incomes. It argues that both the distribution of incomes and the individual's position within the distributive hierarchy are profoundly significant in explaining an individual's justice evaluation. Judgment theory provides theoretical support for this argument, i.e. range-frequency theory (Parducci 1965), which pinpoints two psychological processes used by individuals to make value judgments. It proposes that an individual's value judgments are based on two contradicting psychological principles which take the range as well as the frequency of the (income) distribution into account. Despite its theoretical relevance, it is surprising that range-frequency theory has not yet been widely considered by justice researchers and other sociologists studying value judgments.

The empirical analysis is based on 636 full-time and part-time employees in Germany who participated in a factorial survey that was integrated into a larger representative survey study of German employees. Respondents were asked to evaluate their income after they were given information on the incomes of others and their personal position in the income hierarchy within a fictitious working group. The factorial survey contained a dynamic stimulus (Shamon 2012); the income hierarchy was thereby based in part on the respondents' income information (dynamic vignette) and allowed a more realistic stimulus within experimental settings to be used.

This paper proceeds as follows: In the following section we describe range-frequency theory and apply its propositions to research into the justice of rewards. In Section 3, we describe the factorial survey, the data and the strategy of analysis. The empirical results are presented in Section 4 which is followed by a discussion of the results in Section 5.

2. Theory

Traditional approaches into sociological justice theory claim that a person's justice assessment is shaped by the amount of a scarce good (i.e. income) he/she possesses in comparison to a reference standard (Berger et al. 1972), a specific reference group (Crosby 1976; Runciman 1966), or a direct comparison referent, e.g. a colleague (Adams 1965).[1] Relative deprivation theory claims, for example,

[1] In this paper, the terms justice judgments, justice evaluations and justice assessments are used interchangeably. All terms refer to a person's impression of the discrepancy between or the congruence of the actual amount of a good he or she possesses and the amount he or she perceives to be just for him or herself.

that it is not the absolute income but rather the relative income compared with another reference that influences people's emotional and behavioral reactions (Crosby 1976; Davis 1959; Runciman 1966). According to equity theory, a person feels unfairly paid if his/her outcome and input ratio is lower than the outcome and input ratio of a reference person that he/she compares him/herself with (Adams 1965; Walster et al. 1973; Walster et al. 1978). Status value theory stresses the importance of a stable reference framework. The feeling of being unjustly under/over-rewarded is based on a comparison with the typical income of persons that share relevant characteristics (e.g. occupational status and education) (Berger et al. 1972).

Although not directly considered in the theoretical outline, empirical studies typically refer to the relative distance between a person's income and the average income of a comparison standard which is important for the formation of value judgments (e.g. satisfaction, justice evaluations).[2] Unfortunately, this (empirical) research tradition neglects research on the cognitive foundations of value evaluations and other complementary principles that guide the evaluation process as outlined by judgment theory. Range-frequency theory (Parducci 1965), for example, postulates two psychological principles embedded in the cognitive system that point to the relevance that the range of incomes and the person's rank within the income hierarchy have on the person's income evaluation. Therefore range-frequency theory provides new starting points for empirical research, measuring the effect of social comparisons on people's value judgments and going beyond the simple assumption that individuals compare themselves with the average income of a reference group.

2.1 Range-Frequency Theory

Judgment theories provide valuable insights into how people form judgments given a specific stimulus pattern. *Range-frequency theory* (Parducci 1965, 1968, 1984) – a prominent approach in judgment theory – proposes that it is the stimulus's ranking and the stimulus's distribution that function as baseline references for value judgments. (1) The *range principle* states that the distance between the two end-anchors regulates value judgments. It is the ratio of (a) the distance between the actual stimulus and the minimum stimulus and (b) the total range of stimuli within a specific setting

[2] Several studies proved the idea of the importance of the relative income for income justice sentiments (Schwarze 2007; Shamon 2012; Wegener and Steinmann 1995). In happiness research, the proposition of the relative income has become known as the relative income hypothesis and has been more extensively researched and empirically proven (Blanchflower and Oswald 2004; Clark and Oswald 1996; Dittmann and Goebel 2010; Ferrer-I-Carbonell 2005; Knies 2012; Luttmer 2005; McBride 2001; Senik 2004; Shields et al. 2009; Wolbring et al. 2013); see also Senik 2009 for a review. The strategies past research uses for measuring the relative income effect is summarized by Senik (2009) in a four-step procedure: "1) Define a reference group; 2) Calculate its average or typical income and call it reference income; 3) Plug this constructed category into a happiness regression; 4) Look at the coefficient of referent income" (p. 8).

(min-max) that influences a person's judgment. Technically speaking, the range principle can be formalized into:

$$R_i = (\mathrm{I_i} - \mathrm{I_{min}}) / (\mathrm{I_{max}} - \mathrm{I_{min}})$$

The range value R of a stimulus i is determined by the range of the stimulus I_i and the total value range of stimuli within this context, in other words the minimum value I_{min} and the maximum value I_{max}. Thus "the judgment of any event is determined in part by the proportion of the contextual range that is below that event on the dimension of judgment" (Parducci 1984: 10). (2) The *frequency principle* highlights the skewness of the value distribution by emphasizing the stimulus's ranking within the larger context. The frequency principle is summarized in the formula:

$$F_i = (\mathrm{n_i} - 1)/(\mathrm{N} - 1)$$

where the frequency value F_i equals the stimulus's rank n_i in comparison to the number of stimuli N in the larger context. In other words, "the judgment of any event is also determined by the proportion of all contextual events that are below that event (i.e. .01 times the percentile rank of the judged event)" (Parducci 1984: 11).

Thus, range-frequency theory brings two opposing principles together and assumes that it is a compromise between the *range* of the stimuli distribution and the *rank* (i. position of N) in relation to the frequency of the stimuli that determines a person's value judgment. In formal terms, range-frequency theory is summarized as:

$$J_i^P = wR_i + (1 - w)F_i - .5$$

where J_i^P is the value judgment on stimulus i with w being the relative weight of the range principle R_i and the frequency principle F_i that varies between 0 and 1. The weight highlights the compromise between the two principles and illustrates that individuals systematically vary in the significance they attribute to each of the two principles. The constant -.5 only assures a zero centered distribution of value judgments ranging from -.5 to +.5 (Parducci 1984: 11). According to Parducci (1984), "The mean of the value judgments of all events in a context is directly proportional to their degree of skewing, with the relative weighting of position in the range being the constant of proportionality" (p. 11). In a number of experimental studies, Parducci (1968) found empirical support for his proposition: people try to find a compromise between the two principles and use both when forming value judgments.

2.2 Application of Range-Frequency Theory in Social Justice Research

Applied to income evaluations, range-frequency theory predicts that an individual's judgment of his/her income depends on the distribution of incomes within a specific social aggregate.[3] Parducci (1968), for example, comments that "in choosing a job people estimate among other factors, the income that might be expected. The range-frequency theory would complicate such a choice only because it forces consideration of the relativism of judgments – of how satisfying, for example, the expected income would seem when compared with the incomes of others in the same type of work" (p. 90). But what does range-frequency theory add with regard to employed individuals who find themselves embedded within a specific work context? In general terms, range-frequency theory states that it is an individual's *ranking* within a certain income distribution, as well as the *range* of incomes between individual x and the two end-anchors (see the preceding discussion of "anchors") that influence how individuals arrive at different evaluative outcomes (e.g. satisfaction, justice evaluations). In other words, it is a compromise between (a) the position or "rank" of the individual's income within the income hierarchy (i. position of N), and (b) the distance between the person's income and the end-anchors compared with the total "range" of incomes (min-max) that determines how the person evaluates his/her income.

The Significance of a Person's Rank within the Income Hierarchy

Following the *frequency principle*, individuals take into account the full range of incomes and their personal ranking within these. Thus, from a macro perspective, a person's value judgment is more positive if the income distribution is skewed to the right since it implies that fewer people are near the top and that more are near the bottom of the distribution. Hagerty (2000: 765), for example, states that "a person with a fixed income (e.g. $20,000) is predicted to feel happier in the bottom distribution because more people are ranked below that person's income ($20,000) in the bottom distribution". From an individual's perspective, it is the person's "rank" within the larger income order that affects his/her income judgment: the larger the proportion of people who rank below the person's income, the more positive his/her income judgment.

The Significance of the Income Range

Meanwhile, the *range principle* highlights the endpoints of the income distribution as influential reference points: the higher the range between the income of an individual and an end-anchor and the

[3] Jasso (1980) defines the term social aggregate in accordance with Nisbet (1970) as "any physical or conceptual aggregate of humans who are mutually aware of each other and of the aggregate they form" (Jasso 1980: 5).

overall range, the more positive an individual's value judgment is. Whereas Parducci (1984) suggested using the lower endpoint as a reference, Hagerty (2000) suggested using the highest endpoint, as the top varies more strongly across social contexts. Social comparisons again form the baseline mechanism that link social context information with individual judgment. It is, however, not only the distance of an individual's income to the top or end anchor but also the full range of incomes (distance between the two anchors) that is taken into consideration, implying that the larger the range of incomes is, the more negative the person's value judgment.

The role income distributions play in justice evaluations has already been addressed by Jasso (1980) on the macro level. In "A New Theory of Distributive Justice", Jasso (1980) points to the importance of the range of income distributions for the distribution of reflexive justice evaluations. Any change in the income distribution will lead to a change in the distribution of justice evaluations if three assumptions are met: (1) all members of a social aggregate prefer an equal distribution of the good, (2) a consensus exists among all members of the social aggregate on the value of the good, and (3) actual circumstances determine what individuals consider to be just (see also Berger et al. 1972; Homans 1976). Jasso (1980) postulated that it is the arithmetic mean of an income distribution that individuals perceive as a "just" reference point – an image of just rewards. Thus, the distribution of incomes has a direct effect on the justice evaluation process. As income is very unlikely to be distributed equally within a society, and because the distribution is often skewed to the right, people are very likely to find their income to be unjust. This relationship is gradual: the greater the inequality, the higher the perceived injustice. In statistical terms, the theory assumes that when the distance between the median and the arithmetic mean decreases, the likelihood that individuals perceive their income as just increases. "Regardless of the quantity-good's arithmetic mean, as inequality in the quantity-good's distribution decreases (…), the distribution of justice evaluations moves rightward; the mean, median, and mode move toward zero; the proportion unjustly under-rewarded decreases" (Jasso 1980: 21). Jasso (1999) subsequently demonstrated that the relationship between the inequality in incomes and the average of the justice evaluations not only exists if the just reward is restricted to the mean of the income distribution, but also in general.

By shedding light on the mathematical relationship between income distributions and distributions of justice evaluations, Jasso (1980, 1999) demonstrates the link between two macro sociological phenomena. A micro foundation of the relationship is only explained in more detail in Jasso (1980). However, like traditional justice theories, Jasso's (1980) predictions are based on the position of the mean income that individuals consider as just (symbols equal income for everyone) which is used as an overall reference point. It is questionable whether all members of a social aggregate use the

average income as a reference point. This may raise doubts on the predictions of the significance of income distributions on justice evaluations. By claiming that end-anchors play a crucial role in the formation of value judgments in a person's perceptive system, range-frequency theory goes beyond the restrictive assumption and provides additional support for the significance of the range of incomes on justice judgments.

State of the Art

To the best of our knowledge, empirical studies on the effect of the actual income distribution as well as the person's rank on justice evaluations are rare and, in fact, limited to two recent studies. Shamon (2012) conducted an internet-based experimental study of 906 German-speaking employees. Respondents were provided with information on the income of four other anonymous people who had the same occupational qualifications as the respondent. Using this information, the respondent's income was ranked in either a low, middle or high position within the displayed income hierarchy. Moreover, the displayed incomes either made up a relative unequal (gini=.21) or a relative equal (gini=.07) income distribution. A total of six experimental groups were used to examine the effects of income inequalities and a person's rank. When respondents ranked low in the income hierarchy, Shamon (2012) found income distribution had a negative effect; the higher the income inequality, the more unjust the respondents judged their income to be. When income inequality was high, Shamon (2012) identified a positive effect of a person's ranking within the income hierarchy: those who were ranked low in the income hierarchy assessed their incomes as being significantly less just (more unjust) than those with a high ranking.

Another recent study by Shamon and Dülmer (2012) examined the effect of income distributions on non-reflexive justice evaluations that judge the incomes of other people. In their internet-based factorial survey, 671 employed and unemployed respondents living in Germany judged vignettes in which fictitious industrial sales representatives were described as working in different regions. The regions were characterized, among other things, by different income distributions (relative unequal vs. relative equal). The study showed that respondents assessed the incomes of individuals as being more (or less) unjust in the under-rewarding sense when they lived in regions with higher (or lower) income inequality.

Although both studies provide empirical evidence that range and rank play a key role in income justice evaluations under specific conditions, their scope is limited. The role of range and rank is examined in the social context and limited to the specific comparison group of persons with similar occupational qualifications. Thus, it is questionable whether the results can be generalized for the

organizational context. Clark and Senik (2010) and Schneider and Schupp (2010) show, for example, that people compare themselves with close colleagues within their working environment rather than random individuals. Therefore, we expect the rank and the range of incomes to have a specifically strong effect on a person's value judgment in the organizational context, i.e. a working group.

This study seeks to overcome the current limitations and uses an experimental vignette study to examine the application of range-frequency theory in justice evaluations. It aims to find clear answers to (a) whether justice evaluations are based on the distribution of incomes in the organizational context and (b) how a person's ranking within an income hierarchy affects his/her justice judgment. Specific emphasis is placed on the interrelation between the two principles asking which of the effects has a stronger effect on justice evaluations and whether or not they interact with each other.

2.3 Hypotheses

If the application of range-frequency theory to justice research is right, both the person's *ranking* (henceforth also social position) within a given distribution, as well as the *distribution* itself must affect the person's justice judgment of income. Its propositions are straightforward: The range principle predicts that the higher the *range of incomes* within an organization, according to Jasso (1980), the more unequally incomes are distributed in a social aggregate and the likelier it is for people to judge their income as unjustly under-rewarded (H1: distribution hypothesis). The frequency principle assumes that the higher a person's *ranking* within the income distribution, the higher the likelihood for that individual to judge his/her income to be just or over-rewarded (H2: rank hypothesis).

These two hypotheses can be contradictory and raise the question which of the two principles is the more dominant: is it how high people rank within the hierarchy or is it the distance between the two endpoints? The theory assigns different weights for the value judgments. However, there is no consensus about the magnitude of the weight and its variability across persons. This is left as an open question and will be addressed in the empirical study.

Irrespective of the magnitude of the weight, if both effects are prevalent as the theory states, it is right to expect that both effects interact. A high social position within an income hierarchy favors injustice sentiments in the direction of an over-reward (H1), whereas high income inequality favors injustice sentiments in the direction of an under-reward (H2). We expect the intensity of the income injustice felt by a person with regard to his/her own income to increase the higher the income inequality in a social aggregate is and the lower a person ranks on the continuum (H3: interaction hypothesis).

3. Data and Methods

In order to test our hypotheses, we conducted a factorial survey (Jasso 2006; Rossi 1979; Rossi and Anderson 1982), in which respondents were asked to judge fictitious situations described on vignettes. The hypothetical situations varied systematically in various dimensions by the specific attributes of the main actors or situational conditions. The dimension's attributes (also called levels) resembled stimuli that are used in conventional experiments to test whether a theoretical consideration holds or not. The total number of unique attribute combinations of the different dimensions (called the vignette universe) equaled the Cartesian product of all of the attributes of the different dimensions that were chosen to describe the fictitious situation. In the complete vignette universe the levels of different dimensions are uncorrelated with one another. The advantage of vignette studies is that they reduce the measurement error observed in conventional public opinion surveys which arises, for example, due to social desirability. They allow researchers to measure respondents' judgments that are closer to "real" judgments in daily life than conventional abstract survey questions typically used in public opinion surveys (Auspurg et al. 2009; Beck and Opp 2001; Liebig et al. 2009; Sauer et al. 2011).

Sample: The factorial survey on the effect of income inequality and social position on justice evaluations is part of a larger survey study "The Legitimation of Inequalities – Structural Conditions of Justice Attitudes over the Life-Span" by the Collaborative Research Center "From Heterogeneities to Inequalities" at the University of Bielefeld. The dataset provides information on 4,731 randomly selected respondents from an employed population in Germany (sampled from the IAB employment statistics). The questionnaire includes information on the respondent's justice perceptions, justice judgments and justice attitudes as well as a series of other context and respondent specific life aspects and socio-demographic characteristics. As part of a mixed-mode survey design, 1,262 respondents filled in the questionnaire online in a computer-assisted web interview (CAWI). 732 respondents were employed full or part time and provided information on their monthly gross earnings in the main questionnaire.[4] At the end of the main questionnaire, they were invited to participate in our factorial survey on the effect of income inequality and social position on justice evaluations; 636 respondents accepted the invitation. The sample was made up of 38% women (n_{women} = 241) and 62% men (n_{men} = 395) with a mean age of 37. The majority of respondents had a higher education and were employed full time (86%) ($n_{full\text{-}time}$ = 544; $n_{part\text{-}time}$ = 92). The average gross earnings were 3,255 euros per month. Tables A1 and A2 in the Appendix indicate the high diversity of our sample with respect to the tabled socio-demographic characteristics.

[4] Other respondents were asked to provide information on their justice perceptions in a computer-assisted personal interview (CAPI, n=1010) or in a paper and pencil interview (PAPI, n=2459).

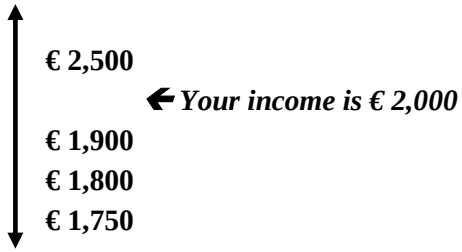
Experimental Design: Our vignettes described a fictitious job setting in which the respondents were told they would be a member of a 5-person working group that had been recently set up in their company. The vignettes consisted of four dimensions that provided the respondents with information on (a) the other team members' earnings ranked in a 4-step income hierarchy, (b) their own ranking in the hierarchy, (c) the duration of the working group, and (d) an explanation for the differences in incomes received by the group members.

The (a) *income distribution* was calculated following a dynamic treatment approach applied by Shamon (2012) that allowed the researcher to manipulate the stimulus according to his or her will by describing a situation that was as realistic as possible for each of the respondents. The respondent's gross income in the fictitious job situation resembled the respondent's original gross income response derived from the main survey questionnaire and served as the basis for the calculation of the other team members' gross incomes. In total, the income inequality in the working group was either low (gini=.07) or high (gini=.21), whereas the mean income of the fictitious income distribution nearly equaled the person's gross income and thus remained constant across the vignettes. (b) The respondent's *social position* was either a high (2^{nd} position) or a low (4^{th} position) position within the fictitious income hierarchy. (c) The *duration of the working group* was either temporary (six months) or unlimited in time (permanent) and (d) the visible income differences were based on differences in job qualifications, job performance, seniority or individual negotiations. The first two dimensions (a/b) are of substantial interest for our hypotheses H1, H2 and H3. The latter two dimensions (c/d) were included in order to suppress any potential speculations on the reasons for the income differences among the respondents that might influence them in their judgment of the situation.

Based on the vignette information, respondents were asked to evaluate their own income in the fictitious situation on an 11-point scale ranging from -5, absolutely unjustly under-rewarded, 0 justly rewarded, to + 5, absolutely unjustly over-rewarded. If individuals perceived their income to be unjust, they were asked to quantify the amount of income they perceived to be just given the specific situational circumstances described in the vignette. This information will be referred to as "just income" below. Figure 1 shows a sample vignette; Table 1 gives an overview on all four dimensions, their levels and the codings of the levels. The vignette universe includes 32 ($=2 \cdot 2 \cdot 2 \cdot 4$) vignettes of which none consisted of a logically implausible combination of attributes. Every respondent that agreed to participate was shown a single vignette that was randomly chosen out of the full set of 32 vignettes.

Figure 1: Example Vignette for a Person with a Monthly Gross Income of € 2,000

Imagine your company sets up a five-person working group [for half a year / permanently]. All group members are expected to work together in order to meet the goals of the project. You belong to this working group. You stated that you earn a gross salary of € 2,000 per month, i.e., before tax and social security contributions. The four other people in the group earn the following incomes:



The differences in incomes are due to
[1: differences in the qualifications of the group members]
[2: differences in the job performance of each member at his or her workplace]
[3: differences in the length of employment at the organization]
[4: the fact that everyone could negotiate their income with their superior].

How would you rate your gross income in this situation? Would you say that it is just, unjustly too low or unjustly too high?

You can state your opinion with values between -5 and +5.

Unjustly far too low					Just					Unjustly far too high
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5

If you do not feel your personal gross income to be just, what do you believe would be a just monthly gross income for you in the situation described?

_____ Euros gross per month

Table 1: Dimensions, Levels and their Codings

Vignette Dimensions (variables)	**Levels (attributes / values)**	**Coding**
Income distribution	Low (Gini = 0.07) High (Gini = 0.21)	0 1
Social position	Respondent ranked in position 2 (lower part) Respondent ranked in position 4 (upper part)	0 1
Duration of work group	Half year Permanent	0 1
Reason for income discrepancies	Job qualifications Job performance Seniority Individual negotiation	1 1 1 0

Analysis: The justice evaluation introduced by Jasso (1978) served as the dependent variable in our study. The justice evaluation (J_m) assessed the congruence between an employee's *actual monthly gross income* (A_m) and his or her *just income* (C_m) as stated directly after reading the vignette.[5]

$$J_m = ln\left(\frac{A_m}{C_m}\right)$$

A justice score of zero means that a person perceives his or her income to be just. A value less than (greater than) zero indicates that the respondent perceived his/her income to be less (more) than he or she felt entitled to, i.e. unjustly under-rewarded (over-rewarded).[6] The logarithmic transformation of the comparison ratio accounts for the fact that deficiencies in the absolute value $(Z = A - C < 0)$ evoke a stronger injustice sentiment among the person doing the evaluating than any surplus in the same absolute value $(Z = A - C > 0)$.

We performed an ordinary least square analysis based on the income justice evaluations in the fictitious job settings(J_m). The term (D_m) in Equation 1 reflects the vector of the four dimensions presented to our respondents in one vignette. The coefficient vector δ indicates the causal effects of our four dimensions. We also included a number of the respondents' socio-demographic characteristics - gender (male/female), age (metric), school education (categorical) and the

[5] If a respondent evaluated his/her income in the hypothetical situation to be just (0) on the 11-point scale, we replaced his/her justice judgment by his/her monthly gross income. This yielded the equivalent justice score of 0.

[6] For further details, we recommend reading Jasso (2007).

respondent's equivalent household income (metric) - as control variables into our model, represented by the term (X_m), to check the robustness of our findings with respect to the dimensions' effects.

$$J_m = ß_0 + \delta * D_m + ß * X_m + e_m$$

4. Empirical Results

4.1 Descriptive Results

Table 2 lists the vignette universe consisting of 32 vignettes. All of the vignettes were used in our survey and every respondent was shown only one randomly drawn vignette. The number of persons that rated a vignette varied from eleven (Vignette 6) to 28 (Vignette 19). The average justice evaluations were negative which means that, after seeing the vignette, the individuals evaluated their income on average as being unjust in the under-rewarded sense.

Table 2: Attribute Combinations in the Fully Crossed Vignette Universe, Persons per Vignette and Change in Justice Evaluations

Vignette V	Social Position	Income Inequality	Reasons for Differences in Income	Working Group	$n(v)$	J
1	High	Low	Qualification	Temporary	18	-.049
2	High	Low	Qualification	Permanent	19	-.066
3	High	High	Qualification	Temporary	18	-.102
4	High	High	Qualification	Permanent	25	-.105
5	Low	Low	Qualification	Temporary	16	-.070
6	Low	Low	Qualification	Permanent	11	-.108
7	Low	High	Qualification	Temporary	25	-.218
8	Low	High	Qualification	Permanent	25	-.170
9	High	Low	Performance	Temporary	18	-.079
10	High	Low	Performance	Permanent	18	-.047
11	High	High	Performance	Temporary	23	-.099
12	High	High	Performance	Permanent	24	-.126
13	Low	Low	Performance	Temporary	18	-.100
14	Low	Low	Performance	Permanent	21	-.121
15	Low	High	Performance	Temporary	20	-.194
16	Low	High	Performance	Permanent	20	-.181
17	High	Low	Seniority	Temporary	16	-.033
18	High	Low	Seniority	Permanent	26	-.021
19	High	High	Seniority	Temporary	28	-.024
20	High	High	Seniority	Permanent	19	-.073

21	Low	Low	Seniority	Temporary	14	-.120
22	Low	Low	Seniority	Permanent	16	-.087
23	Low	High	Seniority	Temporary	24	-.115
24	Low	High	Seniority	Permanent	15	-.147
25	High	Low	Negotiation	Temporary	18	-.095
26	High	Low	Negotiation	Permanent	21	-.082
27	High	High	Negotiation	Temporary	19	-.072
28	High	High	Negotiation	Permanent	24	-.147
29	Low	Low	Negotiation	Temporary	18	-.163
30	Low	Low	Negotiation	Permanent	19	-.128
31	Low	High	Negotiation	Temporary	21	-.224
32	Low	High	Negotiation	Permanent	21	-.260
Total					638	-.114

4.2 Multivariate Findings

Table 3 shows the results of the OLS analysis of the reflexive justice evaluation. The vignette dimensions in Model 1 explain 10.6 % of the variance in the justice evaluations. The significant negative constant in Model 1 reflects the average justice evaluation of persons ranked low in a temporary working group with relatively equally distributed incomes resulting from individual negotiations. The results reveal that the social position has a positive effect: individuals with a high income position evaluate their incomes (b = .076, SE = .013) on average as being less unjust (under-rewarded) than people in lower income positions. Income inequality, on the other hand, affects the justice evaluations negatively: respondents evaluate their own income (b = .055, SE = .012) on average as being more unjust (under-rewarded) when the incomes are distributed more unevenly. These two findings support our working hypotheses H1 and H2.

The effects of social position and income inequality do not differ significantly in a one-sided t-test comparing the coefficients' absolute values ($p < .05$). This indicates that both determinants are equally important. We also found that respondents for whom the income differences were the result of seniority evaluated their income on average as being more just (b = .074, SE= .018) than the reference group in which the income differences were the result of free negotiation ($p < .001$). The duration of the working group was not significant.

In Model 2 we tested Hypothesis H3 which speculates about the interaction of inequality and position effects. We replaced the variables 'high social position' and 'high income inequality' of Model 1 by three dummy variables: 'High Position-Low Inequality', 'High Position-High Inequality' and 'Low Position-Low Inequality'. The reference group consisted of persons who were ranked low in a

hierarchy of relative unequally distributed incomes ('Low Position-High Inequality') - according to our theory the worst possible combination of income inequality and social position in terms of perceived injustice. The findings revealed that the combinations of inequality and rank effects lead to a gradual improvement in the just income evaluations. Individuals that rank high in the income hierarchy, given a more equal income distribution among working group members, had the most positive justice evaluation (b = .130, SE = .017) compared to the reference group (low position and high inequality); followed by those with a high position given a more unequal distribution (b = .095, SE = .020). Those with a low position in a relatively evenly distributed setting were still more positive about their income (b = .078, SE = .019) than those who ranked low in a highly uneven setting (reference group). Thus, we found support for our interaction hypothesis H3.

All results can be replicated, controlling for the respondent's socio-demographic background (see Tables A3, and A4 respectively in the Appendix).

Table 3: OLS Based Analysis - Dependent Variable is J_i

	M1		M2	
	b	SE	b	SE
Constant	-.153***	.019	-.218***	.021
Vignette Characteristics				
Inequality vs. Position				
Social Position: high (Ref.: low)	.076***	.013		
Inc. Inequality: high (Ref.: low)	-.055***	.012		
Interactions				
Position: high/Inequality: low			.130***	.017
Position: high/Inequality: high			.095***	.020
Position: low/Inequality: low			.078***	.019
(Ref.: Position: low /IE: high)				
Reasons for Inequality				
Formal Qualifications	.033	.021	.034*	.020
Performance	.028	.020	.028	.020
Seniority	.074***	.018	.074***	.018
(Ref.: Negotiation Skills)				
Set-up of Working Group				
Permanent (Ref.: temporal)	-.009	.013	-.009	.013
R^2	10.6		11.0	
n	638		638	

Notes: Table 3 reports unstandardized coefficients, heteroscedasticity, robust standard errors, the level of significance *** p< .001; ** p<.01; * p< .05 for one-sided hypotheses; the amount of explained variance (R^2) in percent and the number of observations (n).

5. Discussion and Conclusion

This paper examines the effects of income inequality and social position on a person's justice evaluations in an organizational context (using a factorial survey design). It combines propositions of judgment theory, i.e. range-frequency theory, with sociological justice theories arguing that both the range of incomes in the organization as well as the person's ranking within the income hierarchy influence how a person evaluates their income. The empirical analysis was based on 636 full-time and part-time employees in Germany who participated in a factorial survey that was integrated into a

larger representative survey study of German employees. Respondents were asked to evaluate their income after they were given information on the incomes of others and their personal position/rank in a fictitiously set-up working group within the employee's organization. In so doing, and contrary to conventional factorial surveys, the vignettes described situations in which the respondent, and not a third person, was the main actor in the hypothetical situation. This reflexive vignette design was possible due to the application of a dynamic stimulus (Shamon 2012) based on the information about the respondent's income as established in the larger survey study.

The findings are in line with the empirical implications of Parducci's range-frequency theory (Parducci 1965, 1968, 1984). Employees base their justice evaluations on both the distribution of incomes within the organizational context and their social position within the organizational hierarchy. The more unequally distributed the incomes are in an organization and the lower the person's rank in the income hierarchy, the more the individual will feel that he/she is being unjustly under-rewarded. The effects are equally strong and add to each other in terms of absolute values. In other words, employees are most likely to assess their income as being unjustly under-rewarded if they rank at the bottom of an organizational income hierarchy that shows large differences between those on the top and those at the bottom. Since the effects (of the range and ranking) are not significantly different, the results support Parducci's proposal of a .05 weight in the judgment equation. Moreover, all effects proved to be robust against controls for the respondent's socio-demographic situation, the duration of the working-group setting, and the different reasons for income differences. Overall, the findings show that income distributions in the organizational context, as well as a person's ranking within the hierarchy, are essential for how individuals perceive and evaluate their incomes in terms of justice.

These findings are important for two reasons. First, in terms of its theoretical implications, this paper stresses the contextual conditions of justice evaluation processes and reveals that the amount of inequality as well as a person's individual ranking within an income distribution contribute significantly to how individuals/employees evaluate their income in terms of justice within organizations. By going beyond more traditional approaches of justice research that favor a fixed reference group income as a comparison standard, this paper highlights the importance of the size of income inequality present within a specific reference group (here: workplace) as well as the person's numerical position within this aggregate. Both effects prove to be significant and positive. Employees feel more fairly treated in working environments in which differences in payments/wages are kept low and in which they have (at least the feeling) of belonging to the upper part of the income distribution.

This paper also has practical implications. If perceptions of social injustice result in counterproductive behavior (Greenberg 1990) that hurts the organization in the long run, employers should have a strong

interest in having employees who perceive their income as just. Flattening income hierarchies within the working group setting is one measure to reduce feelings of injustice among employees. Justice is context-dependent and organizations that provide immediate reference standards of income comparisons seem to be of tremendous importance.

This study faces constraints/limitations that need mentioning. Firstly, the study is limited to a fictitious job setting in Germany. More research is needed that examines organizational influences on justice evaluations within a real-world setting (see e.g., Card et al. 2012) looking for country comparisons that give further insights into macro-institutional differences. This point gains relevance by perceptive distortions in the real world. Wegener (1987) found individuals judge their income to be just as they misperceived the social world around them. Persons in upper ranks overestimated the distance of their ranks towards persons ranked below them (polarization of the range continuum), while persons in lower ranks tended to underestimate their distance to persons in higher ranks (leveling of the social hierarchy). Thus, it seems likely that more people would judge the income distribution to be unjust if they knew about their real ranking in an income hierarchy. Therefore more research on the role of information about the income of others in the comparison and evaluation processes appears to be highly warranted.

Secondly, more research is needed on the relevance of the justification processes that people use to legitimate their own incomes and the incomes of others. In this study, seniority proves to be a decisive justification over qualification, effort, or individual negotiation. However, more research is needed on the justification processes that may also vary between organizations or groups.

This said, this study provides two essential insights into the study of justice judgments: First, justice evaluations depend not only on the individual's access to scarce resources but also on the social context he/she is surrounded by. Second, and more importantly, it is not only the average income that is used by individuals as a reference standard to which they compare their incomes, but the distribution of incomes and a person's ranking within the income hierarchy that determines a person's justice evaluation. Thus, the findings support the predictions of range-frequency theory that says it is both the range and the rank that help individuals make a value judgment. The theory's application and further consideration in the field of social justice research appears worthwhile and is therefore highly recommended.

Appendix

Table A1: Descriptive Statistics on Sample Composition

	Observations	Mean / Proportion	SD	Min	Max
Personal Gross Income (in €)	638	3254.05	3506.96	333	70000
Just Income (in €)	638	3646.37	4107.20	400	86800
Household Income (in €)	606	2092.92	1743.56	257.14	38000
Age	635	36.65	10.14	19	59
Male Respondents	638	62.22%		0	1
Part-time Employment	638	14.42%		0	1

Table A2: Distribution of Personal Gross and Household Income

	Personal Gross Income		Household Income	
	Frequency	Percent	Frequency	Percent
< 1000€	28	4.39	42	6.93
[1001 to 2000€]	153	23.98	324	53.47
[2001 to 3000€]	197	30.88	168	27.72
[3001 to 4000€]	123	19.28	54	8.91
[4001 to 5000€]	74	11.60	11	1.82
[5001 to 6000€]	22	3.45	0	.50
[6001 to 7000€]	17	2.66	3	.00
> 7000€	24	3.76	4	.66
	638		606	

Table A3: Replications of Model M1 - Dependent Variable is J_i – with Control Variables

	M3		M4	
	b	SE	b	SE
Constant	-.200***	.039	-.152***	.020
Vignette Characteristics				
Inequality vs. Position				
Social Position: high (Ref.: low)	.073***	.013	.073***	.013
Inc. Inequality: high (Ref.: low)	-.060***	.013	-.060***	.013
Reasons for Inequality				
Formal Qualifications	.040	.021	.037*	.021
Performance	.032	.020	.032	.020
Seniority	.082***	.018	.079***	.018
(Ref.: Negotiation Skills)				
Set-up of Working Group				
Permanent (Ref.: temporal)	-.009	.013	-.009	.013
Respondent Characteristics				
Male (Ref.: Female)	-.005	.015		
Age	.000	-.001		
Part-time (Ref.: Full-time)	-.007	-.027		
Education (Casmin)	.004	-.003		
Household Income (Equivalent)	.000	.000		
R^2	11.8		11.2	
n	605		605	

Notes: Notes for Table 3 also apply to this table. Model 3 is Model 1 and accounts for control variables. Model 4 resembles Model 1, but is estimated using the same units as Model 3 to allow for a straight comparison between the models.

Table A4: Replications of Model M2 - Dependent Variable is J_i

	M5		M6	
	b	SE	b	SE
Constant	-.269***	.038	-.224***	.021
Vignette Characteristics				
Interactions				
Position: high/Inequality: low	.132***	.017	.132***	.017
Position: high/Inequality: high	.095***	.020	.096***	.020
Position: low/Inequality: low	.086***	.019	.087***	.019
(Ref.: Position: low /IE: high)				
Reasons for Inequality				
Formal Qualifications	.041*	.021	.038*	.021
Performance	.031	.020	.032	.020
Seniority	.082***	.018	.080***	.018
(Ref.: Negotiation Skills)				
Set-up of Working Group				
Permanent (Ref.: temporal)	-.008	.013	-.009	.013
Respondent Characteristics				
Male (Ref.: Female)	-.006	.015		
Age	.000	.001		
Part-time (Ref.: Full-time)	-.008	.027		
Education (Casmin)	.004	.003		
Household Income (Equivalent)	.000	.000		
R^2	12.3		11.8	
n	605		605	

Notes: Notes for Table 3 also apply to this table. Model 5 equals Model 2 and additionally accounts for control variables. Model 6 resembles Model 2 but is estimated on the same units like Model 5 to allow for a straight comparison between the models.

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