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Simone Schneider

The Selection of Pay Referents:
Potential Patterns and Impacts on Life Satisfaction

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The Selection of Pay Referents

Potential Patterns and Impacts on Life Satisfaction[+]

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Berlin, November 2010

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Abstract

Despite the relatively extensive research on pay levels and the consequences of income disparities, little is known about which reference groups people choose for comparative evaluation of personal income and why different selection patterns emerge. The aim of this paper is to dig deeper for answers to the following three questions: (1) What are the most important reference groups for income comparisons? (2) Who tends to use which type of reference group? (3) Which reference groups are most detrimental to life satisfaction? The analysis is based on data from the 2008 and 2009 pretest modules of the Socio-Economic Panel Study (SOEP). The results show the working sphere (colleagues and members of the same profession) to be the most important point of reference for income comparisons, whereas neighbors are the least important. No clear-cut picture emerges for the differential selection of reference groups. Structural characteristics—e.g., level of income, education, and type of employment—are of only minor importance in the selection of reference groups for income comparisons. The results also suggest that individuals are likely to select those reference groups whose income is closest to their own. Therefore, the level of income relative to a reference group is related to the relevance of that group in income comparisons. The consequences of such comparisons for life satisfaction prove to be negative: the more importance an individual attaches to income comparisons with reference groups, the lower his or her life satisfaction. Income relative to neighbors and colleagues only affected life satisfaction when the respondent perceived such reference groups to be relevant in income comparisons. These results challenge previous research suggesting that people are unconscious of the true impact of comparison processes. Nevertheless, the results point to various difficulties in the measurement of social comparison processes and show personal predispositions to be a major factor influencing such comparisons. The results strongly indicate the need for advanced instruments to measure the cognitive processes underlying social comparisons.

Keywords: income comparisons, relative income, reference groups, satisfaction, well-being

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1. Introduction

At the latest since the release of "The American Soldier" by Stouffer et al. in 1949, social scientists have considered social comparisons to be important aspects of the process of self-evaluation. Stouffer et al. observed that soldiers in the U.S. Air Force were less satisfied with their chances of promotion than soldiers in the U.S. Army, although objectively speaking, the former group had better chances of promotion than the latter. Stouffer et al. reasoned that high chances of promotion produced a rise in aspirations and expectations and thus created a high level of frustration in the case of non-promotion (see Merton and Rossi, 1968).

This finding led to an increase in theoretical speculation on the relative nature of personal feelings about, and evaluation of, personal rewards; the theory of relative deprivation (Crosby, 1976; Davis, 1959; Gurr, 1970; Runciman, 1966), equity theory (Adams, 1965; Homans, 1976; 1961), and status value theory (Berger et al., 1972) are just a few of the seminal contributions to this field. The core premise of all these theories is that it is not the level of financial compensation in absolute terms but relative to a reference standard that matters most to people and that determines their sense of well-being. Various empirical findings support the notion of relative standards. The most important research on income evaluation has been produced in the field of empirical social justice research and in studies on income satisfaction (see, e.g., Blau, 1994; Bygren, 2004; Clark and Oswald, 1996; Clark and Senik, 2009; D'Ambrosio and Frick, 2007; Folger and Konovsky, 1989; Glatzer, 1988; Goodman, 1974; Levine, 1993; Moore, 1991; 1990; Mueller and Wallace, 1996; Shapiro and Wahba, 1978; Sweeney et al., 1990). Despite this fairly long research tradition dealing mainly with the consequences of social comparisons for evaluations of reward justice and income satisfaction, little is known about the nature of reference groups, about the kind of referents people use to evaluate their pay, and the reasons for the differential selection of these referents.

The aim of the paper is twofold. The first is to identify the reference groups that individuals use in making social comparisons, and those used by specific social groups in particular. Answers are proposed to the following questions: Which reference groups are most salient (with regard to a typology of pay reference groups)? Which groups use which referents (with regard to the differential selection of pay referents)? The second aim of this paper is to examine the consequences of social comparisons for life satisfaction. The most interesting question seems to concern the differentiated effects of reference groups on levels of well-being. In short, which references are most detrimental to life satisfaction? The analysis is based on data from the 2008 and 2009 pretest modules of the Socio-Economic Panel Study.

2. Theoretical Considerations

Research on social comparison has a long history; it examines how the social environment in which the individual is born, grows up, makes decisions, and behaves affects the course of his or her adult life by offering opportunities and setting constraints. The research has shown that the individual's perception of the social environment and of his or her place within it plays a key role in shaping identity. In this context, comparisons with other people offer crucial points of orientation and means for self-evaluation, and form an essential component of human nature (see, e.g., Buunk and Gibbons,

2007; Buunk and Mussweiler, 2001). Several theories address this phenomenon: these include the theory of social comparison (Festinger 1954), the theory of social evaluation (Pettigrew, 1967), the notion of the comparison level (Thibaut and Kelley, 1959), reference group theory (Merton, 1968), and exchange principles (Blau, 1964; Homans, 1961; Weick, 1966) (see also Goethals, 1986; Kruglanski and Mayseles, 1990; Messick and Sentis, 1983; Suls, 1991; Suls and Wheeler, 2000). The present paper focuses on income evaluations and therefore examines a specific domain of social comparison in detail. Important approaches dealing with rewards and evaluation in the social context are the theory of relative deprivation (Crosby, 1976; Davis, 1959; Gurr, 1970; Runciman, 1966), equity theory (Adams, 1965; Homans, 1967; 1961), and status value theory (Berger et al., 1972), which will be outlined in the following section.

2.1 Classical Approaches on Outcome Comparisons

The *theory of relative deprivation* deals with social comparisons, and examines how the construction of "the other" affects the ways that people evaluate their own circumstances. The state of relative deprivation is an emotional one, defined by a combination of negative feelings, e.g., grievance, resentment, dissatisfaction, anger, disappointment, unhappiness, and a feeling of unfairness (Bernstein and Crosby, 1980: p. 444). The findings of Stouffer et al. (1949) mark only the starting point for various theoretical considerations and conceptualizations that offer interesting insights and improvements on the classification and selection of pay referents. The argument of similarity states that people are more likely to compare themselves with similar others (Davis, 1959), whereas the argument of quantity claims that people are more likely to compare themselves with the quantitatively dominant group of people (Runciman, 1966). Crosby (1976) unites both arguments, claiming that "(a)s the percentage of Person's friends and acquaintances who possess X increases, Person's awareness of Other's possession, his desire for X, and his belief that X can be obtained should all increase. […] Next, seeing someone like himself in possession of X makes Person feel more entitled to own X" (ibid.: p. 95). Despite the lack of consensus in the literature on reference group selection (quantity vs. similarity), there is widespread agreement on the multiplicity of reference groups. Individuals belong to numerous groups during the process of socialization and the development of social identities (ibid.: p. 96), and their referents can be expected to vary with the circumstances and the subject of comparison (Crosby and Gonzalez-Intal, 1984: p. 153, Runciman, 1966: p. 11f). Here, it is not only the social group that potentially serves as a referent, but also individuals or abstract ideas, as will be pointed out in the following sections.

Direct comparisons between specific actors form the starting point for *equity theory*. In a specific exchange situation, Homans (1961) expects individuals to evaluate the proportionality of efforts and rewards in comparison to significant others. A balanced exchange situation is therefore equivalent to a state of equity. Conversely, an imbalance between effort and reward results in inequity. Adams (1965: p. 281) formalizes the principle of proportionality and individuals' expectations regarding exchange situations as follows:

$$Equity\ Equation: \frac{Outcome_{Ego}}{Input_{Ego}} = \frac{Outcome_{Alter}}{Input_{Alter}}$$

The input category comprises all goods that go into the exchange situation, e.g., education, effort, and status. The outcome category comprises all of the results of the exchange, e.g., income, affection, and status. Aspects are considered relevant whenever they are of any use to the observer (*ego*) within the exchange situation. Therefore, the equity equation varies from one observer and exchange situation to

the next. An exchange is considered "just" whenever inputs and outputs are perceived as equitably balanced. Hence, a comparable amount of input is expected to result in comparable outcomes. The theory also makes assumptions about the significant other (*alter*): in the case of income, which is usually based on a contract with a third party (the company or the state), the *alter* is likely to be a colleague—someone who shares the same profession or specific characteristics and enables *ego* to compare the amount of input and output. However, equity theory leaves it up to empirical research to determine who people select as referents for pay level comparisons (see Goodman, 1974).

Status value theory draws on the assumptions of equity theory, concentrating on the concept of reference groups and social comparisons (Berger et al., 1972). The theory states that people develop a general frame of reference by comparing their own inputs and outputs to those of a "generalized other." Expectations about what to consider as just are developed, constituted, and reaffirmed by social experiences. Over time, status value theory has developed a theoretical distinction between collective and individual types of injustice. Injustice is not seen as a disregard of the individual's self-interest, but rather as a strong moral standard that is strongly tied to emotional reactions. Berger et al. (1972) argue for a distinction between *local* and *referential* comparisons. Whereas comparisons with specific persons form local comparisons, referential standards form comparisons with abstract persons in similar situations (see also Hegtvedt, 1990: p. 214).

All three theoretical perspectives point to the relevance of social comparisons in income evaluation. People select referents for comparison in order to decide how they feel about their income. The aforementioned theories differ in their predictions about the significant others who serve as referents, however, and state variously that people select referents who are similar to themselves or different (internal vs. external comparison) and either specific (local) or abstract (referential) in appearance. In general, theory describes the evaluation of pay levels as a complex and dynamic process. People tend to use multiple referents and to differ in the referents they select. In the following, I start by reviewing the literature on possible typologies of reference groups and possible determinants of the selection process.

2.2 A Classification of Pay Referents

The classical taxonomy of pay referent categories was proposed by Goodman (1974), who differentiates between three sets of referents: the other, the self, and the system. (1) The "other" is the most common reference group discussed in the literature on inequity and relative deprivation, but it is a rather broad category. There are many "others" who might serve as referents—friends, neighbors, colleagues, and family members—and it is rather difficult to distinguish among them. Goodman therefore goes a step further and differentiates between referents inside and outside the narrow radius of the respondent's daily life. Here, the organization or close family members serve as in-groups; whereas people who do not work for the same organization serve as outside referents. (2) The "self" can serve as another potential referent. Here, the individual can compare him or herself either to his or her own past job and earnings history, or to his or her current ability to provide for him or herself and his or her family. (3) Comparisons that rely on structural aspects and concern the employer-employee relationship represent another important point of reference for income evaluation. Contracts between the organization and the individual usually delimit the employee's expectations about pay raises and promotions, and serve as reference points for income evaluation in relation to the "system" or organization. Goodman assumes these three categories to be theoretically independent of one another. He expects the individual to use different combinations of referents, resulting in multiple sets of reference groups drawn from the three classes (Goodman, 1974: p. 174).

Subsequent studies rely on Goodman's taxonomy to develop multi-item pay referent scales. Although results are conflicting, five pay referent categories can be distinguished: *social* pay referents refer to comparisons with family, relatives, and friends; *financial* referents identify the current needs of the individual; *historical* referents refer to the job-related issues in the past; *organizational* referents are mainly within the organization; whereas *market* referents refer to comparisons outside the agency/organization (Blau, 1994: p. 1253).

In this study, I aim to reconcile the various approaches to pay referents. In line with the status value theory and the theory of relative deprivation, I differentiate between *local* and *referential* comparisons on the one hand, and between *in-group* and *out-group* comparisons on the other.[1] I use Goodman's category of "the other" to exemplify the typology and test for comparisons with family (partner and parents), friends, colleagues, and neighbors (local comparisons) as well as with people who share similar characteristics, e.g., age, profession, and gender (referential comparisons) (see **Table 1**). Internal reference groups are those who share similar characteristics and/or are close to the individual. Members of the out-group (external referents) are those who are not close, do not necessarily share the same characteristics, and therefore provide little information on the inputs and outputs. In this study, I identify two such out-groups: neighbors (local) and people of the other gender (referential).[2] A more detailed picture emerges when various referential *spheres* are distinguished. Three categories are identified within the aforementioned scheme: The categories partner, family, and friends are considered as private referents, whereas colleagues and people in the same profession are part of the working sphere; societal referents are neighbors and those of same age and same/other gender. The selection patterns people follow when evaluating their income will be discussed in the next section.

2.3 The Selection of Pay Referents

To my knowledge, there is no consistent theoretical approach to the differential selection of referents for income evaluation. Up to now, the research has only attempted to identify the mechanisms that might increase the selection of various reference groups. Three mechanisms that shape preferences for certain groups over others are discussed in the following.

The *salience of the object* of evaluation is a vital precondition for any comparison. Although there are numerous factors – and many unknowns – at work in any comparison process, a comparative evaluation will only be carried out if the object is sufficiently important, or salient, to the individual. An insignificant object, on the other hand, can be expected to lead to far fewer comparative evaluations (Goodman, 1974). In the evaluation of income, the question of salience appears to be of only minor importance. Money is a scarce good that helps to satisfy personal needs and guarantees a comfortable standard of living, and is essentially always salient. Therefore, comparisons to reference groups should play a crucial role in the evaluation of income. Differences in the salience of the object have to be taken into account here as well, since people can be expected to evaluate their earnings differently depending on their personal values (e.g., materialistic vs. post-materialistic) or personal needs.[3]

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[1] Normative standards are not considered explicitly here.

[2] Neighbors form a very heterogeneous group, and simply sharing the same neighborhood environment does not constitute a sufficient basis for comparing monetary rewards. Since neighbors do not necessarily share important similarities or close relationships, I consider them to be an external reference group. People have a fairly high level of information on their colleagues, however, especially when there is a clear and transparent pay structure, e.g., in the public sector or in heavily unionized fields. Within the workplace, the assumption of similarity is therefore fulfilled.

[3] Despite the expected increase in the salience of earnings for lower income groups, it has to be kept in mind that as soon as basic needs are satisfied, it is no longer the absolute earnings that matter most. It is the social environment and its opportunity for comparison that generates desires and fosters aspirations (Easterlin, 1995).

Goodman (1974) considers information on the referent's pay to be another precondition for using a group/individual as a referent.[4] The *availability of information* refers here (a) to the knowledge a person has about a potential referent and (b) to the number of referents about whom he or she possesses this information (Crosby, 1976; Runciman, 1968). When analyzing income structures, the high sensitivity of earnings information has to be considered. Information on other people's earnings is often difficult to obtain, and often only estimates are possible based on rough observations of material consumption patterns (e.g., the neighbor's new car). I therefore assume differences in information availability to exist among the four groups of referents. Those groups whose income is easiest to assess can be expected to serve as primary referents. Family members and close friends (local in-groups) are the closest group emotionally, and therefore the most accessible for the discussion of sensitive issues like income. Furthermore, it should be possible, in many cases, to estimate the income of colleagues and people of the same profession. Out-groups like neighbors and people of the other gender, on the other hand, are more difficult to assess due to their heterogeneity and the opacity of income structures. The same holds for people of the same age and/or gender.

According to equity theory, however, the accessibility of information on the input dimension has to be considered in the evaluation process as well. Distinguishing among different spheres of comparison within the internal category, I expect referents within the working sphere (comparisons with colleagues and people in the same profession) to be the most important due to the accessibility of relevant input information (e.g., personal effort, working hours, efficiency, and sociability). Appropriate input categories are not as easy to assess in the private sphere. Referents like family members or close friends are therefore less likely to be selected as referents than members of one's professional sphere. Similar difficulties are likely to appear for external and referential comparison categories.

The *functionality of a referent* is another factor that might affect the selection process. Goodman (1994) argues that referents are chosen according to their functionality in satisfying the respondents' needs for recognition, achievement, and self-esteem. Referents are thus selected in line with one's needs and avoided whenever those needs are threatened. This does not entail that people usually select referents who are worse off and thereby boost their self-esteem as has been proposed in downward comparison theory (Hakmiller, 1966; Taylor et al., 1983; Thornton and Arrowood, 1966; Wills, 1981).[5] Rather, according to Goodman (1994), it is the type of reference group and its emotional impact (closeness) that seems to matter most. Individuals are therefore expected to select a "closer" reference group (local in-group members) when they expect a positive result (through downward comparisons) and an external out-group reference when they expect negative outcomes (upward comparisons). "The point is not that people do not select negative referents; rather it is that negative referents in certain classes are more likely to be avoided. The more a referent threatens central dimensions of one's self concept and the less opportunity one has to redefine the negative referent as a justification for future benefits (e.g., raises), the less likely that referent will be selected" (Goodman, 1974: p. 178).

[4] Masters and Keil (1987) introduce a *typology of comparisons* referring to the general sources of information that enter into the evaluation process. The authors differentiate among types of information and thus among comparisons of the social, the personal, and other reference standards. The social refers to information on the other, groups I call external referents; I refer to personal information on the individual and on reference groups with which the individual strongly identifies as internal or in-group comparisons. Reference standards, in contrast, are based on previous socialization processes and refer to indexed information, e.g., a moral precept or self-selected goal or an expectation of performance. These issues are not considered in the present paper (Masters and Keil, 1987: p. 15).

[5] In contrast to the downward comparison theory, classical theory on social comparison points to upward comparisons, which Festinger (1954) called the "unidirectional drive upward" (see Buunk and Gibbons, 2007: p. 4). Empirical evidence supports both assumptions: D'Ambrosio and Frick (2007) found that individuals prefer comparisons with worse-off groups, while Ferrer-i-Carbonell (2005) and Moore (1991) identify *better-off groups* as more important for social comparisons.

Table 2 summarizes the different selection mechanisms by type of reference group. I expect the four types of referents to have different likelihoods of being selected. According to the argument of information availability, those groups serve as referents whose income is easiest to assess. Considering the issue of social functionality, close references are most likely to be considered whenever positive outcomes are expected (downward comparison). If this is not the case, it is more likely that distant others will be selected to avoid a loss of self-esteem or other negative consequences. Accounting for information on and comparability of the input category, a further distinction among reference groups emerges. When differentiating among referential spheres (e.g., the private, the public, and the professional sphere), the working context (e.g., comparisons with colleagues and individuals in the same profession) appears to be the most important point of comparison for income evaluations.

2.4 Structural Determinants of the Selection Process

For the examination of the differentiated selection process of social referents, it is important to identify those factors that affect (a) the availability of information on the others' income; (b) the functionality of social comparisons; and/or (c) the salience of monetary rewards. The following factors seem to be likely predictors.

Level of Professionalism

The level of professionalism and the attainment of prestigious roles have been suggested to enhance access to information about payment structures outside one's own organization. This effect may partly be a result of the boundary role of individuals in high-status positions. This implies close interaction with a wide range of individuals in various organizations and increased availability of information on out-group referents (e.g., people with similar professions outside the organization). Therefore, the likelihood of selecting referents outside one's own organization increases with the level of social status. This has been empirically proven by Goodman (1994) using the level of education as an indicator for professionalism.

Level of Income

The level of income is also expected to affect the selection of reference groups not only due to its high correlation with the level of professionalism, the level of outside interactions and the level of information, as mentioned above, but also because individuals with lower incomes tend to be either new to the organization or not to have been promoted like others. They are also more frequently subject to inequities in the workplace due to the loose control mechanisms and wider variation in pay schemes at lower organizational levels (Goodman, 1974). Therefore, individuals in lower income groups are expected to compare themselves more often with others inside than outside the organization.

Relative Income

In the literature, a great deal of attention has been given to whether the income relative to some reference group has also an impact on the relevance of the reference group itself. According to the functionality argument of Goodman (1974), comparisons serve individual needs. Comparisons with members of the family or close friends are usually selected when they allow for *downward comparisons*. Whenever this is not the case, people select more distant groups that do not harm their self-esteem to such a great extent. But relative income does not only relate to the financial standards of the reference groups; it also correlates with the income individuals receive. Therefore, high income groups are more

likely to have positive income gaps and are therefore more likely also to select close self-referents, e.g., members of the family and/or friends.

Job security

Knowledge about others' incomes or pay levels also depends on the value of this knowledge to the individual in his or her current situation. The issue of job security is one situation in which knowledge about the job market and its conditions (e.g., payment structure) becomes important. People in risky jobs are expected to be more aware of the payment structure in their profession and the job market in general, making comparisons with these groups more likely (Buchell and Yagil, 1997: p. 743).

Type of Organization

The transparency of the payment structure varies among different sectors and therefore provides unequal income information. People working in the public sector can easily find out how much their colleagues or others working in the same area earn. Due to the strong regulation of pay structures and broad awareness of other people's incomes, workers in the public sector are more likely to compare themselves with their colleagues and/or others in the same profession (in the public sector). This transparency in the payment structure may be a contributing factor to the high level of social comparison in this sector and as such, would reflect patterns of satisfaction.

Gender

Gender differences in the selection of social referents are a sensitive but crucial issue in the current debate. It is no secret that on average women earn less than men, regardless of their occupation (Moore, 1991; 1990). Despite this obvious income gap, women feel equally or even less deprived than men when evaluating their income, which has prompted researchers to dig deeper. Various studies have stressed this rather counter-intuitive fact and found that "(w)omen and men employ different criteria when evaluating the justice of rewards" (Moore, 1990: p. 60). Whereas for men, reference groups play a rather minor role in the evaluation process compared to other factors such as employment status, hours of work, and marital status, for women, relative deprivation strongly depends on the local reference group and occupational type (Moore, 1990). Bygren (2004) observes that Swedish women tend to compare themselves with others of the same occupation, whereas the national reference pay level serves as the most important pay reference for Swedish men when evaluating satisfaction levels. Further, Moore (1990) points out that within-occupation comparisons occur more often among people of the same gender. This finding implies differences in reference group selection between women in female-typed occupations and women in male-typed occupations. Women are believed to select referents of the same occupation more often than referents from other professions within or outside the organization. Mueller and Wallace (1996) argue that discrepancies between men and women in job and pay satisfaction are due mainly to the perception of injustice. They argue against gender-internal comparisons (in which women compare themselves to women and men to men). Other influences or mechanisms are believed to be at work, however, in the paradox mentioned above. Although the present paper does not focus on the gender gap, gender differences will be taken into account when analyzing the question of who compares him or herself to whom.

Individual Dispositions

Current research also investigates individual differences in personal dispositions towards social comparisons (see Buunk and Mussweiler, 2001). It has been suggested that individuals vary in their selection (or non-selection) of reference groups depending on personal dispositions that make the other more/less relevant when evaluating their own income. Following this line of argumentation, it is not predominantly the availability of information on the other but rather an interest in the other which is rooted in psychological predispositions that increases/decreases the selection of pay referents in general.

2.5 Consequences of the Pay Referent Selection

In line with the theoretical findings outlined above and the empirical underpinnings of the analysis, I expect that relative earnings are more important than absolute earnings in terms of their impact on subjective well-being. In line with equity theory and the theory of relative deprivation, I hypothesize that balance between the self and the referent equates to equity and social justice, which leads to personal satisfaction, while imbalance between the self and the referent results in dissatisfaction. Whether these processes are universal or group-specific will be analyzed in the following chapters (see Campbell et al., 1976; Hagerty, 2000; Hegtvedt, 1990; Homans, 1961; McBride, 2001).

Referents that have been identified in the literature as playing a significant role in personal (income) satisfaction or justice evaluations are people of the same occupation (Goodman, 1974; Bygren, 2004, Mayraz et al., 2009), people of the same gender (Moore, 1990; Mayraz et al., 2009), colleagues (Clark and Senik, 2009), friends (Glatzer, 1988), past personal income (Goodman, 1974), and the national income average (Glatzer, 1988). However, most of these studies were very selective in testing social reference groups against each other and do not present a detailed picture of who compares him or herself to whom. It therefore remains an open question which reference groups are the most important for one's life satisfaction. Another shortcoming of the previous research concerns variations in the relevancy of reference groups. When analyzing the effect of relative income on satisfaction outcomes, one has to bear in mind that relative income does not give us any information on the salience of the reference group in the individual and personal evaluation of the income gap (between *alter* and *ego*). I therefore expect the level of income relative to some reference group to have a greater impact on satisfaction outcomes when the reference group is considered relevant by the individual.[6]

Following on the previous research, Blau (1994) differentiated among five groups of reference standards that influence satisfaction in an inconsistent manner. Accounting for the importance people attached to these reference groups, he observed that the higher the importance of reference groups, the lower the satisfaction with pay level. Further, he discussed the interaction effect of relevancy and relative position of the reference group, which influences satisfaction in a consistent pattern. His results offer interesting insights on the comparison processes but are not easily generalizable. Although the data seem to be of high quality, they are based on information on 162 managers of pharmaceutical companies. Due to the high gender, status, und educational bias in the data, generalizations are not easy to derive. More reliable data was used recently by Clark and Senik (2009) and by Mayraz, Wag-

[6] Here, I would also have to account for the legitimacy of various income gaps. Being worse or better off does not automatically imply a loss or gain in satisfaction as long as it is perceived as fully legitimate. Therefore, personal evaluations of one's own situation and its deservedness (Alwin 1987, Crosby 1976, McFarlin and Sweeney 1992, Sweeney 1990, Trembley et al. 2000, Vest et al. 1994, Younts and Mueller 2001) should be considered as well. Due to data restrictions, this task will be left to future research.

ner, and Schupp (2009). Using European data, the authors observed that comparisons with colleagues, which are fairly common, reduced the individual's happiness less than comparisons with friends (Clark and Senik, 2009). Income relative to the same gender had the highest impact on subjective well-being in Germany (Mayraz et al., 2009). Income relative to neighbors also proved to be relevant, indicating that living in high income neighborhoods increases the level of life satisfaction. Other than Blau (1994), Mayraz et al. (2009) also questioned the significance of the perceived relevance of income comparisons for life satisfaction. Due to only minor correlations between the perceived relevance of specific reference groups and subjective well-being, the authors reasoned that people are unconscious of their reference standards. However, shortcomings in the questions on pay referents limit the scope of conclusions that can be drawn from the two studies,[7] and increase the importance of further research on this topic.

2.6 The Model

In sum, the theoretical considerations outlined above point to the following set of interdependencies: in line with previous studies, I consider the level of income relative to the selected reference group as essential for the individual's well-being. Nevertheless, I also consider the following aspects, which have been neglected in previous studies: (a) it is not only the level of income in comparison to some referent that is important to the subject's well-being, but (also) the subjective relevance of reference standards that has to be taken into account, (b) further, I argue that the relevance of certain reference groups varies among individuals in a systematic way (determined by socio-structural characteristics), (c) and that the level of income relative to pay referents and its relevance are interrelated.

3. Data & Methods

3.1 The Data

The analyses are based on data from the Socio-Economic Panel Study (SOEP). SOEP is an annual household panel that has been conducted in Germany since 1984 (Haisken-DeNew and Frick, 2005; Wagner et al., 2007). Questions asking respondents whom they compare themselves with and how high/low they rate their income in relation to these reference groups were asked in the 2008 and 2009 SOEP pretest modules. The samples consist of 1,066 (2008) and 1,007 (2009) randomly chosen respondents between the ages of 16 and 92.

Following revisions in the 2009 pretest module, the questions in the two modules have been compared for effectiveness (see Schneider and Schupp, 2010). The questions on social comparisons proved to be valid for the employed population in both years. Although a slight improvement in the response rates was observed in 2009, I chose to pool the two pretests for the employed population, controlling for measurement effects by introducing a time dummy in the analyses. In detail, the sample consists of 908 respondents (472 in 2008; 436 in 2009), which represent 44.3% (2008) and 43.3% (2009) of the total sample size.

[7] Clark and Senik (2009) use data from the third wave of the European Social Survey. Despite its high quality, the questionnaire did not allow people to choose more than one (here, the most important) reference group. Therefore the question of who compares themselves to whom and its consequences for life satisfaction cannot be explored in full detail. Mayraz et al. (2009) use data from the 2008 pretest module of the Socio-Economic Panel Study. Due to various shortcomings, the questions on pay referents were revised in 2009 (see Schneider and Schupp, 2010).

3.2 The Variables

In line with previous research (Blau, 1994), respondents were asked (a) about the *level* of their actual income compared to some reference group; and (b) the *importance* of this reference group when evaluating their own income. Respondents were asked to judge the relevance of the given referents with respect to their income on a seven-point scale, ranging from "completely unimportant" to "extremely important." In a second step, respondents had to rate their income in relation to these reference groups on a five-point scale, in which one was labeled "much lower" and 5 was labeled "much higher" (see Schneider & Schupp, 2010). Besides analyzing each of the items on pay referents separately, a sum score of pay-level references was created to account for comparisons in general.

For measuring *subjective well-being*, the question on overall life satisfaction from the standard questionnaire was introduced to the model. Respondents were asked whether they were satisfied with their lives on an 11-point scale ranging from "completely dissatisfied" to "completely satisfied."

Information on the *social demography* (gender, age, and residency) and other *status characteristics* (education, income, and marital status) of the respondents were introduced to test for the differentiated selection processes of social referents. Information on the *type of contract* (temporary vs. permanent) and *type of agency* (social services vs. others) was considered as well. To control for *personal predispositions* towards pay level comparisons, I used a proxy by creating a variable that identifies those who do not seem to rely on any reference whatsoever.[8] The variables and their operationalization are listed in **Table 3**.

3.3 The Methods

The analysis is divided into three sections: (1) after giving a broad overview of the response patterns of pay-level referents in the first section, (2) the second section analyses the selection process of these referents. The nine referents are regressed separately on various socio-economic determinants including personal income relative to the referent. (3) In the third section, I analyze the relevance of these referents for life satisfaction. I test different models according to the personal importance of the referents. I expect the more personal referents to have a stronger impact whenever these are important to the individual personally. All estimations were calculated separately for men and women. To guarantee representativeness for the employed German population, standard weights are applied to correct for biases in the sample. The multivariate regression models are calculated with the software Stata 10.

[8] Personal dispositions towards social comparisons are a psychological concept that relies on a complex set of information on personal preferences, perceptions, and orientations. The use of a proxy that relies on the available information on pay referents in the SOEP pretest modules is not considered a valid and reliable way of measuring personal orientations towards social comparisons. The results therefore have to be interpreted with great caution. Further, I strongly recommend the use of approved measurement instruments in surveys like the Iowa-Netherlands Comparison Orientation Measure developed by Gibbons and Buunk (1999) (see Schneider and Schupp, 2010).

4. Results

4.1 Response Patterns

Relevance of Specific Reference Groups

The results on the relevance of pay-level references show a high tendency to perceive reference to the other as playing a relatively minor role in evaluating one's own income (**Table 4**). This implies a highly right-skewed distribution pattern for most reference groups considered in the questionnaire. Contrasting the different reference groups, I observe the lowest relevance (less than 50%) for *local* referents: neighbors, friends, and parents. Gender also appears to be rather unimportant (the opposite gender in particular).

Comparing the mean structure across reference groups, the results show a clear preference for referents from the professional sphere. People tend to compare themselves more often to people in the same profession or colleagues in the same organization than to any other reference group. Further, the results on the mean structure not only support the insignificance of comparisons with neighbors, parents, and friends, but also indicate that women are unlikely referents for men.

The summary statistics of missing values give further indications that the questionnaire is cognitively difficult for respondents and also that certain reference groups tend to be less important to specific populations. The comparatively high rate of missing values for comparisons with partners or colleagues, for example, might indicate that these groups are not used as referents (especially for those with no partner or with a different type of working environment, e.g., the self-employed). However, the relatively high missing rate for comparisons with parents and the opposite gender could indicate cognitive difficulties in assessing the importance of these groups. Gender differences also suggest that reference groups are not only valued differently by men and women but also decoded differently (**Table 6**). Women tend to use friends as pay referents significantly more often than men; women (as a reference group) prove to be of much lower importance as referents to male than to female respondents; women show an overall higher tendency to refuse to answer about pay referents than men.

Income Relative to Specific Reference Groups

A different picture emerges for the evaluation of income relative to the reference groups considered in the questionnaire (**Table 5**). Here, normal distributions are observed for most of the references. The results show that most of the time, people perceive themselves to be paid equally well/badly in comparison to the referents considered in the questionnaire. Slight differences appear with regard to gender. Women tend to perceive their income as slightly lower than others (**Table 6**). General exceptions to this rule are (a) the positive evaluation of their own income compared with parents, which illustrates the upward trend in intergenerational mobility; (b) men tend to estimate their own income more positively than women's incomes—whether compared with their own partner or with women in general (**Table 5**).

Although the percentage of missing values was lower in the 2009 questionnaire (see Schneider and Schupp, 2010), the average rate of non-response is exceptionally high, ranging from 18% to 40% for women and from 16% to 34% for men (employed population in 2008 and 2009). This might indicate high uncertainty in respondents regarding these reference incomes due to the high intransparency of pay structures and a lack of knowledge on the part of the respondent (see Schneider and Schupp,

2010). The high rate of non-response for income questions about neighbors and the low rate for questions about friends, colleagues, and people in the same profession also support this assumption (**Table 5**).[9]

4.2 Differential Selection Patterns of Pay Referents

To explain differential selection patterns of reference groups, linear regression models with robust standard errors were computed separately for women (**Table 7a**) and men (**Table 7b**).[10] In detail, the following conclusions can be drawn on the relevance of the different sets of reference groups:[11]

In general, the selection of pay referents does not seem to follow a specific pattern, either for men or for women. Income is the only factor influencing the selection process that increases the general relevance of reference groups for women (see *sum-score index*). *Comparisons with partners* vary widely between the sexes. For women, the linear regression model suggests that middle-aged women tend to compare themselves less with their partners than younger or older women. For men, I observe a significant decrease in the relevance of partner comparisons between years of observation, which, however, cannot be explained by methodological effects like the wording of the item. Regarding *comparisons with parents*, I again find evidence of a u-shaped age effect for female respondents. Further, the linear regression model shows that parents are more important as referents for married than for unmarried women. Whether or not this can be explained by having children, which might increase the awareness of intergenerational issues, needs to be investigated further. For men, no significant effects are observed. Women and men also differ in the *selection of friends* as income referents. Whereas no significant predictors can be identified for women, the results show a rather complex pattern for men. The linear regression model shows a negative income effect, which indicates that low-income men compare themselves with friends more than high-income men do. However, men with high education compare themselves on average more often with their friends. The u-shaped age effect further suggests that middle-aged men compare themselves on average less often with their friends than younger or older age groups. Results on *comparisons with colleagues* working for the same organization show that women in East Germany show a higher tendency towards comparisons with colleagues than women in West Germany. Men, however, are less likely to compare themselves with their colleagues when they are marginally employed, in vocational training, or already in partial retirement. In general, *comparisons with neighbors* are not only unconventional but also difficult to explain.[12] The results indicate that women with temporary contracts and men employed part-time are less likely to compare themselves with their neighbors. *People in the same profession* are the most common group for in-

[9] Again, the high rate of missing values for the partner's income has to be interpreted with care; it combines some individuals who do not know the answer with those who simply do not have a partner.

[10] To control for unobserved variables that lead to a correlation of the error terms, e.g., a psychological predisposition towards social comparisons, I estimated seemingly unrelated regression (SUR) models as well. This seemed most convenient, as the Breusch-Pagan Test suggests that for both sub-populations (men and women) independence of the error terms can be excluded. Deviations between the regression models were rather weak. Accounting for the fact that robust t-statistics could not be taken into account by the SUR models, linear regression models with robust t-statistics serve as empirical references for this paper.

[11] The overall fit statistics (F-test) for the regressions vary among reference groups. For women, I observe poor fits for comparisons with neighbors, parents, partners, and other women. For men, the F-statistics show poor fits for comparisons with parents, women, and other men. The results for these reference groups should therefore be interpreted with caution. Further, I observe a high discrepancy in the explained variance between reference groups. Whereas only 1% to 5% of the variance is explained for the referents parents, neighbors, and people of the same gender, the highest rates of explained variance are found for friends, colleagues, and people who share the same profession, ranging between 9% and 11%. The share of explained variance for the sum score models varies between 8% for men and 13% for women.

[12] These two aspects might be interrelated. Due to the low relevance of this group for most people, a highly right skewed distribution is observed, which leads to questionable standard statistics.

come comparisons. Women with high income tend to compare themselves more often within others in the same profession. Women employed part-time, however, are less likely to compare themselves to others in the same profession. No such pattern can be observed for men. As men get older, they compare themselves less often to others in their profession. No simple picture can be drawn for *comparisons with similar age cohorts*. With an increase in education, women compare themselves less with others of the same age. No significant effects can be observed for men. Results on *comparisons with the same gender* suggest that with an increase in age, the likelihood of comparisons with other women decreases. No significant effects can be observed for men. Although men and women tend to compare their income with groups of the same gender, a more differentiated selection pattern can be observed for *comparisons with the other gender*. For women, the models show a u-shaped age relationship indicating that middle-aged women compare themselves less often to men than younger and older women. In addition, an increase in the importance of men as referents for women can be observed over the years of observation (2008 to 2009). In contrast, the models report a higher likelihood for men to compare themselves with other men among East Germans than among West Germans.

In a next step, consequences of *upward and downward comparison* are analyzed. The results reported in **Table 8** reveal that in some cases, relative income affects the relevance of the reference group. This proves to be the case for income relative to parents (for women), and for income relative to neighbors and referents of the same age and same gender (for men). Nevertheless, the results contradict the hypotheses stated above: it seems that it is not the direction of comparison that matters (upward or downward) but the discrepancy from the reference group as such. Whenever people tend to under- or overrate their income in comparison to the groups stated above, the importance of these groups as referents in pay level evaluations decreases. The perceived equality between the respondent and the referent therefore seems to enhance the relevance of these groups.[13]

4.3 Life Satisfaction – Do Social Comparisons Matter?

What are the consequences of social comparisons and the differential selection of reference groups? Do people tend to select those groups that increase or decrease their life satisfaction?

A common finding in the literature on life satisfaction is that relative standards are more important than absolute income levels. Unfortunately, not much is known about the relative impact on satisfaction outcomes when differentiating among a set of various referents. In the following section, results on life satisfaction and social comparisons are reported. First, a basic regression analysis has been conducted, controlling for standard demographics such as age, level of education, equivalent household income, marital status, work status, region, and year of observation. The results are displayed separately for men and women.

The results in **Table 9** show that about 15% to 16% of the variance in life satisfaction is explained by standard demographics. The most important predictors here are the level of household income and the level of education: the higher the socio-economic status of the respondent, the higher the level of satisfaction. Being married is another important predictor—for men as well as women—that needs to be considered when analyzing well-being. Surprisingly, no differences are found between the two regions, age groups, or work statuses.

[13] Comparisons with other men seem to be an exception. Whenever men overvalue their own income towards the average men, it leads to a decrease in the importance of this reference group.

In a second step, a proxy for personal dispositions towards social comparisons was added to the baseline model. The results in the second column of **Table 9** show a significantly higher level of satisfaction for those who do not perceive any of the referents considered in the questionnaire to be relevant to their evaluation of income compared to those who did attribute at least some relevance to these referents. This finding supports the assumption that there is a personal disposition towards social comparisons that has a considerable effect on individual well-being and should therefore be taken into account in the analysis of pay evaluations and their consequences.

In a third step, the impact of social comparisons on life satisfaction was tested. The main question was: what are the significant reference groups that matter to the individual and affect his/her well-being? **Table 10** presents the results of the regression analysis. The regressions were run separately for the relevance people attributed to specific reference groups and relative income levels. The results show no coherent pattern for either regression. (1) Whereas women's life satisfaction is affected by comparisons with their partner, other women, and colleagues, men's well-being is affected by comparisons with colleagues, people of same age, and other men. In general, the results indicate that the more people make comparisons with others, the lower the subjective well-being. Hence, social comparisons seem to reduce life satisfaction. (2) The results show a different pattern for relative income levels. Women's life satisfaction is affected by their relative income compared to colleagues, people of the same profession, and the gender category. The higher their own income in comparison to these groups, the higher their life satisfaction. For men, relative income does not matter at all.

Finally, life satisfaction was regressed on relative income separately for those who attributed any relevance to the reference group of concern and those who did not. The results in the last columns of **Table 10** show that income relative to neighbors (for women) and to colleagues (for men) only matter to individual well-being when the person perceives these groups as relevant to the evaluation of their own income. This finding is confirmed by the results on the sub-population that did not attribute any relevance to specific reference groups. In general, when individuals do not attribute relevance to a specific reference group, no impact of relative income is found. Nevertheless, one finding is striking. Women who do not attribute any relevance to other women in their evaluation of income are more likely to show a significant effect of relative income on life satisfaction. This finding becomes even more interesting when considering that women who see other women as important referents show no effect of relative income on life satisfaction.

5. Discussion

The aim of the paper has been threefold: (a) to propose a theoretical pattern of possible reference categories in the process of pay evaluation; (b) to highlight the differential selection process of pay referents; and (c) to provide examples of how the selection process affects life satisfaction. In the literature on pay referents, several types of referents have been examined: the empirical research has focused on comparisons with "the other," "the self," and "the system"; whereas theoretical approaches address broader categories of social comparisons, such as "local vs. referential" standards and "in-group vs. out-group" comparisons. The present paper has tried to establish a system of pay referents in relation to the aforementioned categories, providing empirical evidence on references to "the other". Taking this classification of referents as a starting point, differential patterns of the selection process have been outlined within the two categories (a) "availability of information" and (b) "functionality of pay referents," referring here to upward vs. downward comparisons and the issue of personal attachment. Several social characteristics have been identified as essential for the selection of social referents, and

consequences for the individual's well-being have been discussed. The results on the selection patterns display a rather complex picture. Several features can be identified:

(1) In general, people do not appear to place a high value on referents when asked to evaluate their pay in a questionnaire. Nevertheless, there are differences in the extent to which certain reference groups are used in income comparisons. In accordance with previous research (Clark and Senik, 2009), the working sphere proved to be the most common environment in which income comparisons take place: people generally compare their income with colleagues and/or people in the same profession. In contrast, comparisons with neighbors or parents were the least common, which might relate to the incomparability of input and output categories of both reference groups (see equity theory), and/or the unavailability of income information (applying here only to comparisons with neighbors). To gain further insight into the different profiles of personal comparisons (who people select and who they do not select), I recommend the use of latent class analysis. This is left to future research.

(2) Gender differences become most apparent when people evaluate their income relative to reference groups. Both subpopulations proved to have a realistic evaluation of their income relative to others. On average, men perceived themselves to be better off than their partner or women in general, as well as their own parents. In contrast, women perceived themselves to be worse off relative to most of the reference groups, with the exception of their own parents. Unsurprisingly, they perceived the highest discrepancy between their own income and that of their partner and men in general.

(3) Missing values provide at least some insight into the availability of information on the reference group or the cognitive ability to recall information on the reference group through personal experiences, general perceptions, or stereotypes. When comparing their personal income to others, people seemed to have most problems recalling information on neighbors. In addition, categories like gender (the same and the other) seemed to present difficulties, especially for men; the age category as well as comparisons with parents proved to be troublesome for women.

(4) Differentiating between specific characteristics essential to the process of reference group selection, the results are rather complex and difficult to untangle. No specific differential set of selection patterns could be identified according to the type of reference group (internal vs. external and in-group vs. out-group comparisons). On the whole, the results do not support the theoretical assumptions. However, two findings deserve further attention. According to my theoretical reasoning, women in higher income groups were more likely than lower income groups to perceive comparisons (in general) to be relevant (supporting the need theory argument). At the same time, high-income women turned out to find comparisons within the same profession to be more important than low-income women (supporting the relative income hypothesis). No empirical verification of these hypotheses, however, was found for men, which suggests the need for further research on gender-based differences in the selection process. Further, the empirical findings point to interesting selection mechanisms within the male population. Comparisons with friends showed an increase with the level of education but a decrease with the level of income. Educational biases in pattern of friendship may provide a potential explanation of this empirical finding. Men who share the same educational background and can look back on shared experiences in higher education may be more likely to compare themselves with each other than men whose friendships did not evolve around shared educational experiences. This finding calls for further research, keeping in mind that comparisons with friends are extremely detrimental to one's life satisfaction (see Clark and Senik 2009).

(5) Investigating preferences for upward vs. downward comparisons, the results were rather surprising: neither of the hypotheses were supported by the empirical analysis. Instead, people seemed more

likely to select referents from whom they perceived no difference: this proved to be the case for comparisons with parents (for women), neighbors, and people of same age (for men).[14]

(6) Analyzing the consequences of differential selection patterns on life satisfaction, I found evidence in favor of the hypothesized negative influence of social comparisons on satisfaction outcomes. People with a certain predisposition against social comparisons reported higher levels of satisfaction. In detail, the findings showed that the higher the reported relevance of specific reference groups (partner, colleagues, other women for women, and same age and other men for men), the lower the reported level of life satisfaction. Further, I observed a positive impact of relative income on life satisfaction, at least for some of the reference groups for the female population (colleagues, profession, same/other gender): the higher the income relative to the reference group, the higher the level of reported life satisfaction. In some cases (neighbors for women and colleagues for men), relative income only had an effect on life satisfaction when respondents perceived this group to be of at least some relevance to them. Surprisingly, income relative to other women still proved to be important for women's life satisfaction even when no relevance was given to this specific reference group.

To assure credibility of the results, measurement biases have to be minimized. In this regard, I recommend further research on two issues: the improvement of measurement instruments on pay referents and the use of instruments to measure personal predispositions towards social comparisons in analyses of pay-level evaluations. Personal dispositions towards social comparisons constitute a popular issue in the recent psychological debate and also need to be stressed when pay referents are analyzed. The results of the present study support the current claim that people's personal dispositions towards or against social comparisons affect their responses to the evaluated outcome (see Buunk et al., 2007). To control for such biases, I strongly recommend the use of appropriate instruments (e.g., the Comparison Orientation Measure developed by Gibbons and Buunk, 1999). This would make it easy to identify personal dispositions, which would improve research on processes of social comparisons and the selection of pay referents. In addition, the measurement of pay referents in large-scale population surveys has to be called into question. Within the field of cognitive science, social comparisons are considered to be rather spontaneous processes that often take place subconsciously (see Mussweiler et al., 2004). Together with the findings on non-response, it is questionable whether the instrument used to measure self-reflection and cognitive awareness of thought processes is adequate. Therefore, I strongly encourage further research analyzing the cognitive ability to answer questions about comparison processes. The development of more refined techniques to circumvent cognitive biases and observe the underlying dimensions of comparison processes in large standardized population surveys will be one of the major tasks for upcoming research in the empirical study of reference groups.

[14] Whether these results are biased—all of the referents had been identified as the most problematic ones in regard to missing values—has to be further investigated.

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Table 1: Typology of Social Referents. Exemplifies on the two axes (1. the level of abstraction (local vs. referential) and 2. the personal distance (internal vs. external)) different categories of social references for pay level evaluations. Three spheres of comparison are cross-cutting: the private (here: partner, parents, and friends), the societal (here: neighbors and those of same age and same/other gender), and the professional sphere (here: colleagues and those of same profession).

	Local	**Referential**
Internal	partner, parents, friends, colleagues	same profession, age, gender
External	neighbors	opposite gender

Table 2: Likelihood of Selecting a Type of Reference Group. Varies according to (a) the availability of information (+) and (b) the direction of social comparison (upward vs. downward): the higher the availability of information (+++) the higher the likelihood of serving as a referent. The direction of social comparison affects the selection of referents according to the personal distance (internal/external) of social referents: whenever downward comparisons are possible for internal references, the likelihood of selection increases (while upward comparisons with external referents increase the likelihood of selecting those).

	Local		**Referential**	
Internal	+++*	downward	+*	(downward)
External	+	upward	+	upward

*Referents within the working sphere (comparisons with colleagues and people in the same profession) are expected to be the most important due to the accessibility of relevant input information.

Table 3: Operationalization of Social Demographics. Reports variables for the prediction of outcome variables stated in section 3.2.

Sex	women vs. men (ref.)
Age	age in years
Age squared	age in years – squared
Region	East vs. West Germany (ref.)
Education level	casmin2 (middle); casmin3 (high); Ref.: casmin1 (low)
Income	logarithmic function of monthly net income
Household income	logarithmic function of net equivalent household income;
Employment status	Regularly part-time employed; others (partial retirement, vocational training, marginally employment); Ref.: employed; (excluded: non-employed and military/community service)
Type of contract	temporary vs. permanent contract (ref.) (Reference group includes category "no contract/does not apply to employment status")
Type of agency	public service vs. other types (ref.)
Personal Disposition	no reported relevance of any of the nine reference groups vs. at least some relevance of referents reported (ref.)

Table 4: Summary Statistics on the Importance of Reference Groups. Reports for all nine referents the percentage of agreement for each cell (ranging from 1, completely unimportant, to 7, completely important), the missing values, the mean levels, the standard deviation, and the number of observations. Results are displayed separately for women and men based on the SOEP pretest modules 2008 and 2009 for the employed population. Standard weights are applied to adjust for sampling bias.

	Reference Group	1	2	3	4	5	6	7	Miss.	Mean	Sd.	Obs.
Female	**Partner**	46.6	9.0	9.1	18.0	10.2	3.9	3.2	9.0	2.6	1.8	414
	Parents	59.8	16.3	6.0	11.7	4.1	1.1	1.0	4.2	1.9	1.4	448
	Friend	52.5	14.0	9.1	15.2	6.1	2.6	0.5	2.6	2.2	1.5	457
	Colleague	36.8	7.0	7.2	17.6	13.4	12.1	5.9	4.3	3.2	2.1	446
	Neighbor	65.1	13.7	6.5	10.7	2.6	0.7	0.8	2.6	1.8	1.3	455
	Profession	29.9	5.1	6.2	17.4	16.7	15.4	9.3	2.7	3.7	2.1	456
	Age	41.6	10.3	8.7	18.6	13.0	5.3	2.5	2.1	2.8	1.8	457
	Same gender	44.3	8.2	8.8	18.7	13.0	5.3	1.7	2.3	2.7	1.8	456
	Other gender	50.4	10.4	8.0	17.4	8.8	4.0	1.1	5.0	2.4	1.7	444
Male	**Partner**	52.2	9.1	7.1	13.2	5.3	7.9	5.4	5.9	2.6	2.0	401
	Parents	61.2	11.0	8.7	10.1	5.5	2.6	1.0	2.5	2.0	1.5	424
	Friend	51.6	11.9	12.5	11.7	7.3	4.0	1.0	1.5	2.3	1.6	430
	Colleague	36.7	8.7	9.7	14.9	12.2	10.6	7.3	3.1	3.2	2.1	424
	Neighbor	67.7	14.0	5.9	7.4	4.0	0.5	0.5	1.5	1.7	1.2	430
	Profession	31.8	7.6	7.5	13.4	13.9	15.4	10.6	1.2	3.6	2.2	431
	Age	44.4	8.3	8.6	15.8	11.7	8.3	2.9	1.0	2.8	1.9	432
	Same gender	55.5	10.4	6.3	13.3	8.1	5.2	1.3	2.1	2.3	1.7	427
	Other gender	65.8	10.7	6.0	9.4	5.3	2.0	0.8	3.4	1.9	1.4	418

Table 5: Summary Statistics on the Income Relative to the Reference Group. Reports for all nine referents the percentage of agreement for each cell (ranging from 1, much lower, to 5, much higher), the missing values, the mean levels, the standard deviation, and the number of observations. Results are displayed separately for women and men based on the SOEP pretest modules 2008 and 2009 for the employed population. Standard weights are applied to adjust for sampling bias.

	Reference Group	1	2	3	4	5	Miss.	Mean	Sd.	Obs.
Female	Partner	36.6	28.9	20.4	11.0	3.0	27.6	2.2	1.1	325
	Parents	13.3	17.0	23.5	28.2	18.0	30.4	3.2	1.3	323
	Friend	15.0	24.4	48.8	10.6	1.1	24.6	2.6	0.9	355
	Colleague	12.3	16.1	65.7	5.1	0.8	21.3	2.7	0.8	376
	Neighbor	26.1	23.1	35.5	13.3	2.1	40.3	2.4	1.1	292
	Profession	10.1	19.3	63.6	5.8	1.2	18.5	2.7	0.8	383
	Age	13.5	23.9	45.0	15.4	2.2	30.5	2.7	1.0	331
	Same gender	10.9	22.4	49.8	14.4	2.5	26.4	2.8	0.9	345
	Other gender	36.3	31.3	22.7	8.1	1.5	28.3	2.1	1.0	336
Male	Partner	6.2	10.0	25.4	27.6	30.8	23.5	3.7	1.2	305
	Parents	8.0	14.4	23.7	31.6	22.4	23.0	3.5	1.2	331
	Friend	6.5	18.6	51.0	22.3	1.7	18.4	2.9	0.9	353
	Colleague	5.3	12.3	66.0	13.6	2.8	16.0	3.0	0.8	362
	Neighbor	11.3	21.9	36.9	24.1	5.8	32.7	2.9	1.1	293
	Profession	5.1	18.2	65.7	9.7	1.4	16.8	2.8	0.7	358
	Age	5.4	25.2	39.6	28.1	1.8	24.3	3.0	0.9	332
	Same gender	6.3	18.3	53.0	19.3	3.2	31.2	3.0	0.9	300
	Other gender	3.0	10.5	38.5	34.5	13.5	34.2	3.5	1.0	285

Table 6: Gender Differences in Mean Structure. Reports two-tailed t-tests on the equality of means. Displays the amount of deviation in means and the level of significance (***p<0.001, **p<0.01, *p<0.05). Based on the SOEP pretest modules 2008 and 2009 for the employed population.

Reference groups	Relevancy	Relative Income
Partner	-0.08	**1.41*** **
Parents	0.08	**0.17***
Friends	**0.19***	**0.29*** **
Colleague	-0.11	**0.24*** **
Neighbor	0.02	**0.38*** **
Profession	-0.06	**0.11***
Age	0.01	**0.30*** **
Women	**-0.72*** **	**0.63*** **
Men	-0.05	**0.88*** **

Table 7a: Linear Regressions for Perceived Relevance of Reference Group. For Women. Reports coefficients, level of significance (***p<0.001, **p<0.01, *p<0.05), robust t-statistics (in parenthesis), share of explained variance (R^2), and number of observations. Based on the SOEP pretest modules 2008 and 2009 for the employed population. Standard weights are applied to adjust for sampling bias.

	Index	**Partner**	**Parents**	**Friend**	**Colleague**	**Neigh-bor**	**Profes-sion**	**Age**	**Same Gender**	**Other Gender**
Year	-0.28	-0.08	0.02	-0.21	-0.49	0.08	-0.39	-0.19	0.18	**0.43***
	(0.19)	(0.32)	(0.11)	(1.15)	(1.94)	(0.46)	(1.58)	(0.87)	(0.78)	(2.08)
East/West	1.89	0.12	-0.12	0.28	**0.62***	0.09	0.24	0.07	0.13	0.03
	(1.08)	(0.35)	(0.45)	(1.10)	(2.03)	(0.38)	(0.71)	(0.26)	(0.49)	(0.12)
Age	-0.68	**-0.18***	**-0.17****	-0.11	-0.03	-0.07	-0.00	-0.13	**-0.14***	**-0.15****
	(1.47)	(2.42)	(2.67)	(1.95)	(0.43)	(1.40)	(0.03)	(1.88)	(2.18)	(2.66)
Age^2	0.01	**0.00***	**0.00***	0.00	0.00	0.00	-0.00	0.00	0.00	**0.00***
	(1.05)	(2.11)	(2.44)	(1.46)	(0.08)	(1.20)	(0.27)	(1.59)	(1.93)	(2.36)
Ln_Income	**3.77***	0.27	0.01	0.03	0.49	0.01	**0.60***	0.37	0.21	0.21
	(2.22)	(1.00)	(0.03)	(0.13)	(1.81)	(0.03)	(2.18)	(1.73)	(0.95)	(1.02)
Casmin2	-1.58	-0.36	-0.14	0.03	-0.10	-0.04	-0.12	-0.33	-0.07	-0.06
	(0.80)	(1.02)	(0.56)	(0.14)	(0.27)	(0.21)	(0.31)	(1.08)	(0.23)	(0.26)
Casmin3	-4.12	-0.49	0.19	-0.09	-0.67	-0.16	-0.53	**-0.95****	-0.41	-0.09
	(1.71)	(1.21)	(0.59)	(0.31)	(1.65)	(0.61)	(1.29)	(2.75)	(1.36)	(0.32)
Part-time Employed	-2.43	0.02	-0.37	-0.07	-0.13	0.04	**-0.72***	-0.20	-0.33	-0.45
	(1.14)	(0.05)	(1.46)	(0.28)	(0.42)	(0.17)	(2.29)	(0.63)	(1.26)	(1.79)
Other Employed	-0.40	-0.07	-0.56	-0.24	0.17	-0.44	0.51	-0.10	-0.18	-0.65
	(0.13)	(0.14)	(1.34)	(0.60)	(0.29)	(1.21)	(0.90)	(0.20)	(0.37)	(1.51)
Temporary contract	-0.24	-0.12	-0.09	-0.35	-0.33	**-0.45***	0.50	-0.15	-0.26	-0.32
	(0.10)	(0.28)	(0.30)	(1.41)	(0.89)	(2.24)	(1.30)	(0.45)	(0.77)	(0.93)
Public service	-0.46	-0.08	-0.12	0.16	0.02	0.26	0.46	0.15	-0.40	-0.32
	(0.26)	(0.26)	(0.51)	(0.63)	(0.06)	(1.04)	(1.54)	(0.57)	(1.51)	(1.44)
Married	-0.03	0.45	**0.45***	-0.35	-0.23	-0.12	0.24	-0.10	0.22	0.06
	(0.02)	(1.64)	(2.09)	(1.70)	(0.81)	(0.66)	(0.86)	(0.40)	(0.97)	(0.25)
Constant	8.56	**4.67***	**5.23****	**4.95****	1.69	3.38	0.46	3.93	**4.42***	**4.41***
	(0.59)	(1.99)	(2.79)	(2.78)	(0.68)	(1.82)	(0.18)	(1.86)	(2.19)	(2.49)
R^2	**0.13**	**0.01**	**0.03**	**0.11**	**0.09**	**0.05**	**0.11**	**0.06**	**0.03**	**0.07**
Obs	**260**	**276**	**299**	**308**	**305**	**306**	**307**	**308**	**308**	**298**

Table 7b: Linear Regressions for Perceived Relevance of Reference Group. For Men. Reports coefficients, level of significance (***p<0.001, **p<0.01, *p<0.05), robust t-statistics (in parenthesis), share of explained variance (R^2), and number of observations. Based on the SOEP pretest modules 2008 and 2009 for the employed population. Standard weights are applied to adjust for sampling bias.

	Index	**Partner**	**Parents**	**Friends**	**Col-league**	**Neigh-bor**	**Profes-sion**	**Age**	**Same Gender**	**Other Gender**
Year	-0.67 (0.43)	**-0.65*** (2.26)	0.13 (0.56)	-0.09 (0.43)	-0.34 (1.16)	-0.07 (0.40)	-0.30 (0.97)	-0.12 (0.47)	0.19 (0.83)	0.06 (0.28)
East/West	4.69 (1.64)	0.73 (1.39)	0.37 (0.91)	0.29 (0.80)	0.43 (0.84)	0.34 (0.98)	0.35 (0.66)	0.44 (1.05)	0.75 (1.88)	**0.72*** (2.13)
Age	-0.53 (1.09)	-0.17 (1.85)	-0.06 (0.82)	**-0.16*** (2.40)	-0.16 (1.90)	-0.00 (0.00)	**-0.16*** (2.05)	-0.08 (1.12)	-0.00 (0.06)	0.04 (0.71)
Age²	0.00 (0.81)	0.00 (1.58)	0.00 (0.69)	**0.00*** (2.16)	0.00 (1.63)	0.00 (0.08)	0.00 (1.53)	0.00 (0.84)	0.00 (0.01)	-0.00 (0.77)
Ln_Income	-0.75 (0.58)	-0.10 (0.42)	-0.16 (0.83)	**-0.28*** (2.07)	0.19 (0.82)	-0.14 (0.95)	0.22 (0.88)	-0.33 (1.84)	-0.09 (0.52)	-0.20 (1.74)
Casmin2	0.48 (0.25)	0.20 (0.54)	0.38 (1.23)	0.33 (1.20)	0.02 (0.06)	0.14 (0.74)	-0.26 (0.62)	-0.55 (1.60)	-0.33 (1.04)	0.19 (0.73)
Casmin3	-0.40 (0.19)	-0.29 (0.73)	0.17 (0.62)	**0.61*** (2.11)	0.10 (0.22)	0.26 (1.15)	-0.13 (0.29)	-0.50 (1.31)	-0.63 (1.95)	-0.24 (0.93)
Part-time Employed	-3.63 (1.01)	0.55 (0.74)	-0.04 (0.07)	-0.77 (1.75)	-1.13 (1.76)	**-0.84***** (3.63)	0.07 (0.11)	-0.53 (0.90)	-0.18 (0.39)	-0.11 (0.26)
Other Employed	-5.11 (1.31)	-0.81 (1.16)	-0.26 (0.55)	-0.86 (1.51)	**-1.29*** (2.00)	-0.20 (0.57)	-0.76 (1.07)	-0.33 (0.51)	0.06 (0.12)	-0.37 (0.92)
temporary contract	0.05 (0.02)	-0.54 (1.22)	-0.02 (0.06)	0.12 (0.30)	0.14 (0.25)	-0.01 (0.06)	0.30 (0.54)	0.42 (0.98)	-0.02 (0.06)	0.32 (0.91)
public service	-0.66 (0.39)	0.45 (1.14)	-0.01 (0.02)	-0.25 (1.01)	-0.59 (1.92)	0.02 (0.08)	-0.55 (1.48)	-0.07 (0.25)	-0.17 (0.74)	0.37 (1.32)
Married	1.60 (0.75)	0.09 (0.26)	0.31 (1.15)	-0.01 (0.05)	0.29 (0.75)	-0.06 (0.29)	0.14 (0.35)	0.46 (1.48)	0.09 (0.28)	0.27 (1.05)
Constant	**31.49*** (2.22)	**7.36**** (2.73)	**4.07*** (2.11)	**7.75***** (4.38)	**5.89*** (2.45)	2.62 (1.91)	**6.57**** (2.68)	**7.24***** (3.61)	3.18 (1.73)	2.15 (1.42)
R^2	**0.08**	**0.09**	**0.00**	**0.12**	**0.09**	**0.04**	**0.10**	**0.05**	**0.02**	**0.05**
Obs	**241**	**253**	**272**	**276**	**274**	**276**	**277**	**277**	**274**	**265**

Table 8: Regression of Perceived Relevance of Reference Groups on Income Relative to Those Reference Groups. Reports coefficients, level of significance (***p<0.001, **p<0.01, *p<0.05), and robust t-statistics (in parenthesis) for the perceived relative income (negative vs. positive evaluations); as reference serves the equal share of income. Standard controls included a quadratic in age, logarithmic function of income, and dummies for education level, marital status, work status, type of contract (temporary vs. permanent), type of agency (public service vs. others). Results are displayed separately for women and men based on the SOEP pretest modules 2008 and 2009 for the employed population. Standard weights are applied to adjust for sampling bias.

	Relative Income	Partner	Parents	Friends	Colleague	Neighbor	Profession	Age	Same Gender	Other Gender
Female	**negative**	-0.24 (0.64)	**-1.16***** (3.70)	0.10 (0.42)	0.08 (0.24)	-0.41 (1.41)	0.05 (0.13)	-0.36 (1.11)	-0.14 (0.48)	-0.43 (1.52)
	positive	-0.63 (1.27)	**-0.90**** (2.90)	-0.03 (0.09)	-0.60 (1.17)	-0.52 (1.89)	-0.07 (0.15)	-0.31 (0.90)	-0.29 (0.74)	-0.54 (1.06)
	Obs	0.002	0.095	0.124	0.096	0.154	0.098	0.066	0.025	0.089
	R^2	226	217	253	269	197	268	229	243	233
Male	**negative**	-0.34 (0.66)	-0.08 (0.21)	-0.00 (0.01)	0.05 (0.11)	**-0.94***** (3.61)	0.26 (0.64)	**-0.94***** (3.61)	0.10 (0.27)	0.36 (0.87)
	positive	-0.12 (0.28)	-0.14 (0.39)	-0.52 (1.80)	0.03 (0.06)	**-0.78**** (2.68)	0.10 (0.21)	**-0.78**** (2.68)	**-0.65*** (2.28)	-0.19 (0.67)
	Obs	0.077	-0.006	0.135	0.100	0.167	0.136	0.167	0.058	0.045
	R^2	204	225	244	251	198	247	198	210	195

Table 9: Baseline Model for Life Satisfaction. Linear regression models of life satisfaction on social characteristics and personal dispositions towards social comparisons. Reports coefficients**,** level of significance (***p<0.001, **p<0.01, *p<0.05), and robust t-statistics (in parenthesis). Results are displayed separately for women and men based on SOEP pretest modules 2008 and 2009 for the employed population. Standard weights are applied to adjust for sampling bias.

	Female		**Male**	
	baseline	**base + suppl.**	**baseline**	**basel. + suppl.**
Year of Observation	-0.05 (0.25)	-0.07 (0.40)	0.26 (1.07)	0.27 (1.17)
East-Germany (Ref.: West-Germany)	0.28 (1.49)	0.26 (1.39)	-0.13 (0.75)	-0.20 (1.19)
Age	-0.01 (0.24)	-0.01 (0.29)	-0.07 (1.51)	-0.06 (1.47)
Age Squared	0.00 (0.34)	0.00 (0.36)	0.00 (1.31)	0.00 (1.19)
Ln - Equivalent Household Income	**0.53** (2.66)	**0.55** (2.77)	**0.50** (2.39)	**0.49** (2.35)
Education (Middle) (Ref.: Low)	**0.87** (3.22)	**0.85** (3.19)	**0.84** (3.75)	**0.85** (3.88)
Education (High)	**1.00** (3.31)	**0.96** (3.19)	**0.54** (2.25)	**0.54** (2.25)
Part-time Employed (Ref.: Full-time Employed)	-0.16 (0.73)	-0.19 (0.86)	-0.52 (1.48)	-0.51 (1.46)
Other Employment	-0.35 (1.15)	-0.35 (1.19)	0.38 (1.01)	0.38 (1.01)
Marital Status: married (Ref.: all other)	**0.58** (2.80)	**0.57** (2.82)	**0.66** (2.93)	**0.71** (3.26)
Personal Disposition		**0.54** (2.40)		**0.51** (2.14)
Constant	2.38 (1.21)	2.31 (1.18)	**4.26** (2.46)	**4.25** (2.48)
R^2	0.158	0.171	0.145	0.163
Obs	330	330	313	313

Table 10: Linear Regressions of Life Satisfaction on Social Reference Groups. Reports coefficients, robust t-statistics (in parenthesis), the share of explained variance, and the number of observation for (a) the perceived relevance of the reference group; (b) the income relative to the reference group; the relative income (c) whenever no relevance is attributed; and (d) some relevance is attributed. Standard controls include a quadratic in age, logarithmic function of income, and dummies for education level, marital status, and employment status. Results are displayed separately for women and men. Based on SOEP pretest modules 2008 and 2009 for the employed population. Standard weights are applied to adjust for sampling bias.

		Relevancy				Relative Income				Relative Income: no relevance				Relative Income: relevance			
		Coeff	t	R^2	Obs	Coeff	t	R^2	Obs	Coeff	t	R^2	Obs	Coeff	t	R^2	Obs
	Partner	**-0.11***	(2.27)	0.16	299	-0.01	(0.13)	0.19	243	-0.14	(1.05)	0.22	100	0.13	(1.05)	0.23	142
	Parents	-0.01	(0.11)	0.15	322	0.12	(1.32)	0.19	242	0.14	(1.08)	0.18	120	0.02	(0.17)	0.29	119
	Friends	-0.08	(1.25)	0.16	329	0.19	(1.50)	0.20	276	0.17	(0.92)	0.22	123	0.27	(1.56)	0.28	152
Female	**Colleague**	**-0.13****	(2.64)	0.19	321	**0.31***	(2.39)	0.20	287	0.12	(0.46)	0.21	81	**0.37***	(2.37)	0.24	203
	Neighbors	-0.09	(1.24)	0.17	327	0.21	(1.44)	0.21	226	0.08	(0.45)	0.18	123	**0.45***	(2.37)	0.36	103
	Profession	-0.09	(1.86)	0.17	328	**0.39****	(3.15)	0.21	290	0.07	(0.29)	0.28	65	**0.53*****	(3.88)	0.25	224
	Age	-0.10	(1.69)	0.17	329	0.02	(0.12)	0.20	254	0.28	(1.71)	0.38	71	-0.15	(0.69)	0.23	182
	Same gender	**-0.14***	(2.59)	0.18	328	**0.37****	(3.02)	0.21	267	**0.42***	(2.42)	0.34	88	0.21	(1.36)	0.23	179
	Other gender	-0.12	(1.93)	0.18	320	**0.25***	(2.17)	0.20	260	0.20	(1.10)	0.29	99	0.22	(1.51)	0.24	160
	Partner	-0.01	(0.12)	0.14	287	-0.05	(0.54)	0.18	234	-0.05	(0.42)	0.23	114	-0.09	(0.67)	0.18	119
	Parents	-0.07	(1.17)	0.15	307	0.02	(0.24)	0.18	253	0.04	(0.40)	0.18	138	-0.03	(0.26)	0.33	112
	Friends	-0.10	(1.73)	0.16	313	0.10	(1.07)	0.20	274	0.18	(1.24)	0.28	120	0.01	(0.05)	0.21	154
Male	**Colleague**	-0.05	(1.01)	0.15	309	0.15	(1.27)	0.18	281	-0.02	(0.10)	0.20	91	**0.33***	(2.40)	0.22	189
	Neighbors	-0.09	(1.56)	0.15	313	-0.08	(0.88)	0.22	226	-0.16	(1.71)	0.29	132	0.07	(0.36)	0.24	94
	Profession	**-0.09***	(2.12)	0.16	312	0.22	(1.48)	0.18	277	0.22	(0.78)	0.26	72	0.27	(1.46)	0.19	204
	Age	**-0.16*****	(3.37)	0.19	313	0.11	(1.02)	0.18	255	0.03	(0.16)	0.26	96	0.24	(1.81)	0.24	159
	Same gender	**-0.15****	(2.96)	0.16	310	0.08	(0.72)	0.19	238	-0.06	(0.41)	0.22	107	0.16	(1.11)	0.27	130
	Other gender	-0.10	(1.79)	0.15	303	0.01	(0.12)	0.20	222	0.04	(0.26)	0.22	119	-0.07	(0.42)	0.31	101