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# A matter of perception: Exploring the role of income satisfaction in the income–mortality relationship in German survey data 1995–2010

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ABSTRACT

Individual- and community-level income has been shown to be linked to social inequalities in health and mortality. On the individual level, social comparisons and relative deprivation resulting from them have been identified as relevant mechanisms involved in the relationship between income and health, but it is mainly income-based measures of relative deprivation that have been considered in previous studies. Using income satisfaction, this study employs a perception-based indicator of relative deprivation.

The study, covering the period between 1995 and 2010, utilized the German Socio-Economic Panel. The follow-up included 11,056 men and 11,512 women at employment age 25–64. Discrete-time survival analysis with Cox regression was performed to estimate the effects of relative income position and income satisfaction on all-cause mortality.

The univariate analysis revealed an income gradient on mortality and further showed a strong association between income satisfaction and survival. After education and employment status were adjusted for, the effect of discontent with income on mortality was still present in the female sample, whereas in the male sample only the income gradient prevailed. When self-rated health was controlled for, the hazard ratios of income satisfaction attenuated and turned non-significant for both men and women while the effects of income position remained stable.

In conclusion, the findings suggest that income satisfaction and income position measure different aspects of income inequality and complement one another. Income satisfaction appeared to be a possible contributing component to the causal pathway between income and mortality.



## Introduction

Extensive research has continuously explored the question of whether the amount of income received or the income of others are important aspects affecting individual health (Gerdtham & Johannesson, 2004; Lynch et al., 2004; Mackenbach et al., 2005; Sutton, 1998). The first assumption is represented by the absolute income hypothesis, which denotes poverty and material deprivation as harmful conditions for health which directly affect health. The second notion assumes that comparisons with relevant others on the individual level (the relative income hypothesis) and comparisons on the community level influence the health of the individual (the income inequality hypothesis). On the community level, overall income distribution has been suggested to affect health – an individual in an equal society is less affected than one in an unequal society (Judge, Mulligan, & Benzeval, 1998; Mackenbach, 2002).

Increasing interest in the role of social comparison mechanisms on the individual level is reflected in the considerably frequent adoption of the relative deprivation theory in previous studies on income inequality and health (Adjaye-Gbewonyo & Kawachi, 2012). The term relative deprivation (RD), coined by Runciman (1966), argues that individuals perform upward social comparisons with idealized others within their social context, e.g. in similar occupational strata rather, than referring to unachievable high standards of elite groups. According to Runciman, individuals pay attention to those in upward rather than downward social positions, which subsequently induces feelings of deprivation, discontent and inferiority. The experience of inadequacy is not limited to affecting the individual's psychosocial state and subjective well-being; as abundantly shown, RD is suspected to evoke health problems when it comes to mental health (Åberg Yngwe, Fritzell, Lundberg, Diderichsen, & Burström, 2003; Eibner, Sturn, & Gresenz, 2004), self-rated health (SRH) (Kondo, Kawachi, Subramanian, Takeda, & Yamagata, 2008), children's health through their mother's exposure to RD (Lhila & Simon, 2010) and mortality (Åberg Yngwe, Kondo, Hägg, & Kawachi, 2012; Deaton, 2001; Salti, 2010).

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Somewhat mixed findings have been demonstrated for functional disability (Kondo et al., 2009) as well as SRH, depending on the reference categories used (Subramanyam, Kawachi, Berkman, & Subramanian, 2009) or the chosen statistical method (Jones & Wildman, 2008).

Similar to RD, the relevance of relative social comparisons has been denoted earlier (Duesenberry, 1949; Festinger, 1957). RD became an influential empirical construct with Yitzhaki's development of an index enabling the implementation of RD in individual-level data. Yitzhaki proposed that income inequality measures be decomposed on the aggregated level, based on the Gini index, into an index assigned to each individual (Yitzhaki, 1979). In brief, the so-called Yitzhaki index signifies the individual's income compared to the sum of income gaps for all other individuals richer than him/her divided by the number of individuals in the reference group.

Drawing on the macro-level perspective, Pedersen (2004) pointed out that the Gini index and related concepts such as Yitzhaki's decomposition represent a relativistic conception of inequality that can be seen as function of income inequality, which in addition allows envy to intervene. However, as entirely income-based measures, the Gini index and its derivations are incapable of capturing all aspects and thus the complete scope of RD (Smith, Pettigrew, Pippin, & Bialosiewicz, 2012). They more likely reflect the unequal distribution of resources on the community level. A central assumption in the RD concept is the presence of a properly defined reference group which is the object of the individual's desires. The capacity and validity of Gini-based conceptions depend on the suitable specification of reference groups and the level of aggregation, e.g. local, regional, national etc. People are highly selective in whom they compare themselves with, which makes its problematic to choose the appropriate scope of the reference group while simultaneously needing to exclude non-members (Pedersen, 2004). Some exemplary studies have overcome these constraints somewhat by constructing reasonable comparison groups based on occupation, regional and ethnic similarities or assuming a combination of these (Åberg Yngwe et al., 2012; Pham-Kanter, 2009). Nevertheless, it is difficult to ensure that individuals make the same comparisons that researchers assume in their analyses (Smith et al., 2012). Furthermore, it is often overlooked that RD only persists when individuals perceive income differentials as unfair (Subramanyam et al., 2009). Despite the presence of income inequality, there may be income differences that appear tolerable, for instance when a low-educated person is environed by high-income earners whose higher education legitimates their earning more (Bygren, 2004; Smith et al., 2012).

In addition to these relatively evident constraints, strictly income-based measures (such as the Yitzhaki index, but also Deaton's approach (Deaton, 2001)) conceal an important distinction, which Runciman makes: that RD varies in magnitude and intensity. Although the Yitzhaki index quantifies the aggregated upward income differentials (termed as “magnitudes” in Runciman's conception), it is indifferent to the degree of emotional intensity to which RD is felt by the individual (Subramanyam et al., 2009). Considering Runciman's notion, income satisfaction (IS) is appealing as such an indicator of the intensity of RD. Moreover, IS accounts for the aspects that have been disregarded by income-based approaches and rather focusses on the perception side of income inequality.

IS can be regarded as the discrepancy between desired income and received income, and the extent to which the received income complies with the individual's expectations and aspirations compared to idealized others and prior income histories. Used in social comparison and equity theories (and thus similar to RD), IS denotes the importance of the social context – how people's aspirations and expectations are influenced by their perception of and comparison with reference standards, perceived social norms and benchmarks. IS addresses potentially multiple reference standards: past income trajectories or current income, income standard relative to one's own merits and qualifications, and comparison with peers such as neighbours, friends and colleagues. Solberg et al. asserted that realistic desires tend to make people happier than unreasonable desires beyond the individual's abilities and resources (Solberg, Diener, Wirtz, Lucas, & Oishi, 2002). In conjunction with low income position and RD, (dis)satisfaction with income and self-perceived underperformance go along with stressful social comparisons, frustration and anger, which in the long run might result in health problems. The provisional research on IS has not yet identified whether the social environment or internalized attitudes and standards of the individual him/herself are more important. Intra-personal traits, preoccupation, self-awareness and internalized norms might therefore override comparison with others. Nevertheless, a Swedish study on people's pay reference standards identified the national pay level and occupational pay level as the most important reference categories, whereas the workplace was less relevant as a reference (Bygren, 2004). The results differed somewhat for men and women, showing that the national level was more influential for men whereas women more often referred to the occupational level. Past income trajectories had only a limited influence; current income was valued as most relevant (Bygren, 2004). The relevance of the national income level in the Swedish case might be peculiar, since income information for virtually every citizen is publicly available through the governmental tax authority. Furthermore, Sweden has a relatively homogenous income distribution that many people regard as the reference level. The German case to which this study refers represents quite the opposite: income information is treated as confidential and people refuse to discuss their income with others; this is often stipulated in an employment contract, which itself might generate further dissonances. Despite the non-transparent income of others, a cross-national comparison also considering German data singled out colleagues as the most frequently-cited reference group, as colleagues' incomes serve as a marker for the individual's own future prospects (Clark & Senik, 2010).

Research to date has disregarded the question concerning the extent to which unequal pay for men and women may induce a gender aspect in the perception of income. Compared to other European countries, Germany ranks low when it comes to equal pay for men and women (Busch & Holst, 2008). This gender pay gap is mainly explained by women's lower employment rate and a higher prevalence of part-time employment compared to men. However, concurrent with a rise in women's labour market participation in Germany, it was found that women tend to express increased pay expectations (Liebig, Sauer, & Schupp, 2011). Other studies touching on this topic consistently showed that women in the same job with the same income as men report higher levels of satisfaction compared to their male counterparts since their income expectations are lower (Clark, 1997; Keaveny & Inderrieden, 2000).

As outlined so far, IS is potentially important for several reasons: firstly, as an extension of and complement to RD; secondly, as an indicator of perceived inequality; and finally, as a non-income-based exogenous measurement of income inequality. Compared to index-based mathematical approaches like the Gini index and its derivations, the measure of IS encompasses the emotional self-evaluation of income. While to the author's knowledge it has hitherto not been regarded as an explanatory variable in health studies, IS may – as other measures of social inequality indicate – have implications on health and mortality. Corresponding to prior studies showing that RD has an effect on mortality (Adjaye-Gbewonyo & Kawachi, 2012), the present study aims to test whether IS has an impact on mortality. Previous research has