Deutsches Institut für
Wirtschaftsforschung

DIW BERLIN

Data Documentation

48

Simone Schneider • Jürgen Schupp

Measuring the Selection of Pay Referents

A Methodological Analysis of the Questions on Pay Referents in the 2008 and 2009 Pretest Modules

Berlin, March 2010

IMPRESSUM

DIW Berlin
Deutsches Institut für Wirtschaftsforschung
Mohrenstr. 58
10117 Berlin
Tel. +49 (30) 897 89-0
Fax +49 (30) 897 89-200
www.diw.de

ISSN 1861-1532

DIW BERLIN

Data Documentation 48

Simone Schneider*

Jürgen Schupp**

Measuring the Selection of Pay Referents – A Methodological Analysis of the Questions on Pay Referents in the 2008 and 2009 SOEP Pretest Modules

Berlin, March 2010

* Simone Schneider, Berlin Graduate School of Social Sciences, Humboldt Universität zu Berlin, simone.schneider@sowi.hu-berlin.de. From October to December 2009 guest researcher at DIW Berlin.

** Jürgen Schupp, DIW Berlin, SOEP; Freie Universität Berlin; IZA Bonn, jschupp@diw.de

We want to thank Deborah Anne Bowen (DIW) for her kind support on this paper.

Abstract

Income comparisons are among the key mechanisms used to explain satisfaction and happiness, among other outcomes. Yet progress on the questions of who people use as social referents and whether differential selection patterns exist can only be made based on valid and reliable measures of pay referents included in large-scale population surveys. The German Socio-Economic Panel Study (SOEP) is pursuing this task through two questions on pay referents introduced in the 2008 and 2009 pretest modules of the SOEP. This paper analyses the quality of the two questions on pay referents in the 2008 module and discusses potential for improvement through modifications of the questions in the 2009 module. The paper concludes that the difficulties in answering questions on pay referents were not completely overcome in the 2009 pretest. To provide more solid evidence on potential biases in response behavior, the paper suggests the inclusion of reliable instruments for measuring personal dispositions.

JEL: Classification: D31, D63, Z13
Keywords: income comparisons, relative income, reference groups, SOEP

Contents

1 Measurement of Pay Referents

Comparisons with others are often used to explain counter-intuitive findings in the field of well-being research. Comparisons with neighbors are used to explain, for example, the rather small increases in levels of satisfaction despite absolute increases in income (Duncan 1975). However, the theoretical prominence of social comparisons is usually not reflected in the empirical analysis of satisfaction and happiness. Although large-scale population surveys generally contain questions on income, satisfaction, and general subjective evaluations, respondents are seldom asked directly about the individuals to whom they choose to compare themselves—their "referents"—when evaluating, for example, their personal income. The sensitivity of income questions (Schräpler 2004) is one argument used to discourage the inclusion of social comparison questions in surveys. Another is that such comparisons are made on sub-conscious levels (see Buunk & Mussweiler 2001) of which the respondent may not even be aware. This argument, too, is used to discourage the development of measures of pay referents for inclusion in large-scale surveys. However, if we want to make progress on the question of who people use as social referents and whether differential selection patterns exist (Schneider, forthcoming), we have to establish valid and reliable measures of pay referents and integrate them into large-scale population surveys. The German Socio-Economic Panel Study (SOEP), located at the German Institute for Economic Research (DIW Berlin) is pursuing this task. In this regard, two questions on pay referents were integrated into the 2008 and 2009 pretest modules of the SOEP. The paper analyses the quality of the two questions on pay referents in the 2008 module and discusses potential for improvement through modifications of the 2009 module. Suggestions for general improvements in this field are also addressed.

In the following, the two instruments on pay referents in the SOEP pretest modules are described and modifications in the 2009 questionnaire are outlined (Chapter 2). Direct evaluations of the 2008 instrument suggest problems regarding the comprehension of and response to the questions on pay referents (Chapter 3.1). Further, the two instruments are tested for group (employed vs. non-employed) and time (2008 vs. 2009) invariance. Due to the cross-sectional character of the pretest modules and the manifest nature of reference group measurement, traditional validation instruments (e.g., measurement models) are difficult to apply. Therefore, descriptive statistics are used to test the effectiveness and quality of the two questions. The number of missing values, the overall distribution of response patterns, and differences in mean values will give evidence of an improvement to the measurement instrument implemented in 2009 (Chapter 3.2). Insights into this improvement are also expected from external validation. Variables that are assumed to be linked strongly to the relevance of potential reference groups are correlated (Chapter 3.3). Personal dispositions towards social comparison are discussed as one potential bias in the analysis of pay referents (Chapter 4). A discussion of the results and an outline of its prospects (Chapter 5) followed by a description of alternative instruments on comparison processes (Appendix) complete the investigation of pay referents and their measurement.

2 The Questionnaire

Two instruments on pay referents were tested in the SOEP pretest modules in 2008 (**Table 1**) and 2009 (**Table 2**): one on the relevance of certain referents, the other on the level of income relative to specific reference groups.[1] Respondents were asked to state, on a seven-point scale, the extent to which they used a list of possible referents as points of comparison in evaluating their own income. The scale used ranged 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 ranging from one, "much lower" to five, "much higher".

Table 1: Questionnaire of Pay Level Referents in the Pretest Module 2008

no. 43: When you think about your income compared to that of other groups. Please answer on the following scale, where 1 means: completely unimportant and 7 means: extremely important. How important is it to you how your income compares with that of:	• your neighbors • your friends • your colleagues working in your organization • people with the same profession • people of your age • your parents when they were your age • your partner • other women • other men
no. 44: And how high is your income in comparison with the following people: In comparison to…	

Table 2: Questionnaire of Pay Level-Referents in the Pretest Module 2009. Deviances from the 2008 questionnaire are marked bold.

no. 67: ***Evaluating the amount of earnings, social comparisons with the gross income of other persons can be of importance.*** *When you think about your own* ***gross*** *income compared to that of other groups. Please answer on the following scale, where 1 means: completely unimportant and 7 means: extremely important. How important is it to you how your income compares with that of:*	• your neighbors • your friends **(gendered)** • your colleagues working in your organization **(gendered)** • people with the same profession • people of your age • your parents when they were your age • your partner **(gendered)** • women **in general** • men **in general**
no. 68: And how high is your **gross** income in comparison with the following people: In comparison to…	

Modifications in the wording of question and items were meant to improve the instrument in 2009. Four changes were made: (1) whereas all respondents were asked about reference groups and their relevance in 2008, the two questions were only addressed to the working population in 2009. (2) Further, people were asked directly to evaluate their "gross income" in 2009; this detail was missing in 2008 ("income" in 2008). (3) Several items were adjusted to gender issues in the

[1] The development of the questionnaire relies on previous research on pay referents (see Blau 1994).

2009 questionnaire.[2] In detail, changes were made with regard to comparisons with friends, colleagues, and the partner. (4) The last two items were modified as well. Respondents were asked how high their income was in comparison to women and men "in general" (in 2008: "other women", "other men") and how important this was to them.

[2] This modification has led to substantial differences which are only visible after the translation into German.

3 Evaluation of the Questionnaire

3.1 Assessing Difficulties in the 2008 Questionnaire

The results in **Table 3** indicate that a considerable percentage of respondents seem to have difficulties comprehending and answering the two questions. Differences between employed and non-employed respondents are apparent: 12.8% of the employed and 25.3% of the non-employed population appear to have problems in understanding the questions on pay referents; 15.7% of the employed and 23.6% of the non-employed also seem to have difficulties in responding to these questions.

Table 3: Assessment of Difficulties in the 2008 Questionnaire. Reports percentage of respondents for each level of perceived difficulties regarding comprehension of and response to the two questions on pay referents. Estimations given by the interviewer on a six-point scale, ranging from "excellent" to "unsatisfactory". Based on the SOEP pretest module 2008. Reported separately for employed (N=534) and non-employed (N=532) respondents. Standard weights are applied to adjust for sampling bias.

Evaluation 2008	Comprehension		Response	
	Non-employed	Employed	Non-employed	Employed
Excellent	39.4	46.3	43.4	48.9
Good	35.3	41.0	32.9	35.5
Satisfactory	18.4	9.6	12.3	9.6
Fair	3.6	1.8	8.5	3.0
Poor	2.3	0.9	1.7	2.0
Unsatisfactory	1.0	0.5	1.1	1.1

Interviewers commented on a comparatively high number of interviews (12.5%) in more detail. Three major critiques were expressed: (1) the questions sometimes did not fit the respondent due to his/her current situation (e.g., in school, retired, unemployed, without a partner). (2) The respondent had difficulty answering the questions on relative income due to lack of information and/or disinterest in other people's incomes. (3) Respondent felt uncomfortable answering questions on income and income evaluation. On this basis, several modifications were made in the 2009 pretest module (see **Table 2**). The next section will test whether these modifications led to an improvement of the questionnaire.

3.2 Summary statistics

The summary statistic in **Table 4** displays higher rates of missing values for the non-employed compared to the employed population; non-employed individuals also seem to perceive reference groups as less important than employed individuals (see: mean values or percentage of respondents

who reported complete unimportance of reference groups).[3] The distribution is right-skewed for both populations, suggesting a high number of individuals who do not consider these pay-level referents to be important.

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 reported separately for employed and non-employed based on the SOEP pretest module 2008. Standard weights are applied to adjust for sampling bias.

2008		1	2	3	4	5	6	7	Miss.	Mean	Sd.	Obs.
Non-employed	Partner	55.0	9.9	7.0	12.2	6.2	3.5	6.3	14.4	2.4	1.9	490
	Parents	59.0	12.2	7.2	10.9	5.4	3.6	1.8	6.3	2.1	1.6	555
	Friends	51.4	11.3	11.7	13.0	9.4	2.2	1.0	4.1	2.3	1.6	571
	Colleagues	50.0	7.3	9.2	14.5	7.8	8.8	2.4	25.7	2.6	1.9	430
	Neighbors	64.5	12.9	9.0	8.3	3.5	1.6	0.3	3.8	1.8	1.3	574
	Profession	43.4	6.3	6.6	14.9	10.3	11.6	6.9	17.0	3.1	2.1	494
	Age	44.8	9.2	10.3	19.2	9.0	5.6	2.0	3.0	2.6	1.8	576
	Women	57.3	7.7	7.7	14.9	7.2	2.7	2.5	8.2	2.3	1.7	548
	Men	54.4	10.3	8.5	13.9	6.8	3.5	2.6	6.5	2.3	1.7	559
Employed	Partner	46.1	7.6	9.6	14.2	9.5	7.0	6.2	7.0	2.8	2.0	426
	Parents	61.1	13.5	6.7	10.4	3.9	3.5	0.9	3.2	2.0	1.5	454
	Friends	49.0	11.8	12.0	13.1	8.6	3.9	1.6	1.8	2.4	1.7	461
	Colleagues	30.8	7.1	11.2	15.9	14.4	12.7	7.9	4.3	3.5	2.1	450
	Neighbors	66.3	13.3	5.4	8.5	5.0	0.6	0.9	2.3	1.8	1.3	458
	Profession	26.7	5.4	7.8	16.1	15.7	16.8	11.5	1.6	3.9	2.1	461
	Age	39.2	10.8	9.4	15.5	12.1	9.0	4.1	1.5	2.9	2.0	462
	Women	55.3	9.6	10.3	12.0	7.6	3.8	1.3	3.0	2.2	1.7	452
	Men	54.4	9.5	7.7	13.7	8.4	4.8	1.5	3.2	2.3	1.7	453

In 2009, only employed individuals were asked to report the relevance of certain reference groups in income evaluations. **Table 5** indicates that more respondents in 2009 than employed respondents in 2008 judged reference groups to be unimportant. Although some items were reworded, it seems that no clear improvement was achieved in the response rates (see also **Table 8**). The distributions are right-skewed as well.

[3] Exceptions are comparisons with parents which might refer to an age bias within the non-employed population.

Table 5: 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 reported for the employed based on the SOEP pretest module 2009. Standard weights are applied to adjust for sampling bias.

2009		1	2	3	4	5	6	7	Miss.	Mean	Sd.	Obs.
Employed	Partner	54.0	10.7	6.1	16.5	5.0	5.2	2.5	7.5	2.3	1.8	389
	Parents	60.0	13.0	8.5	11.2	5.9	0.2	1.1	3.4	2.0	1.4	418
	Friends	55.3	14.0	9.9	13.4	4.7	2.8	0.0	2.2	2.1	1.4	426
	Colleagues	43.1	8.9	5.8	16.2	10.9	9.7	5.4	2.9	2.9	2.0	420
	Neighbors	66.9	14.5	6.9	9.2	1.6	0.5	0.4	1.7	1.7	1.2	427
	Profession	35.7	7.8	6.0	14.1	14.4	13.8	8.4	2.2	3.4	2.2	426
	Age	47.5	7.4	7.9	18.8	12.4	4.8	1.2	1.4	2.6	1.8	427
	Women	57.5	9.5	3.9	15.1	9.8	3.2	1.0	2.7	2.2	1.7	422
	Men	52.0	11.3	6.3	16.6	8.4	4.5	0.9	3.5	2.4	1.7	418

The summary statistics in **Table 6** reveal higher rates of missing values for the non-employed population compared to the employed (for almost all reference groups with the exception of neighbors and referents of same age). Further, the results show a trend towards a normal distribution for both populations, with a slight tendency to perceive one's own income as lower than that of the referent. Comparisons with parents are an exception; people tend to judge their income to be higher than that of their parents.

Table 6: Summary Statistics on the Income Relative to the Reference Group. Reports for all nine referents the percentage of reports 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 reported separately for employed and non-employed based on the SOEP pretest module 2008. Standard weights are applied to adjust for sampling bias.

2008	Referents	1	2	3	4	5	Miss.	Mean	Sd.	Obs.
Non-employed	Partner	27.1	18.9	26.7	15.6	11.8	39.1	2.7	1.3	356
	Parents	17.5	15.5	25.6	24.6	16.8	29.9	3.1	1.3	427
	Friends	18.7	16.1	51.7	12.6	0.9	24.8	2.6	1.0	450
	Colleagues	14.7	11.3	63.4	9.6	0.9	58.0	2.7	0.9	268
	Neighbors	30.0	18.8	34.8	14.7	1.7	33.3	2.4	1.1	409
	Profession	15.4	12.0	65.5	5.7	1.5	44.1	2.7	0.9	346
	Age	17.8	23.7	36.6	21.4	0.5	24.7	2.6	1.0	449
	Women	20.8	18.5	36.9	16.4	7.4	39.8	2.7	1.2	370
	Men	29.5	20.4	33.5	14.2	2.4	37.9	2.4	1.1	382
	Partner	18.7	18.5	20.6	23.5	18.9	24.7	3.1	1.4	331
	Parents	9.2	16.2	21.5	33.2	19.9	28.3	3.4	1.2	336
	Friends	10.2	23.2	45.9	190	1.7	23.9	2.8	0.9	358
	Colleague	7.0	14.4	66.4	10.7	1.6	19.2	2.9	0.8	382

Employed	**Neighbors**	16.9	23.0	33.2	20.9	6.1	39.7	2.8	1.1	288
	Profession	6.5	21.0	62.5	9.3	0.8	16.7	2.8	0.7	382
	Age	7.2	26.4	40.6	23.8	2.0	27.7	2.9	0.9	342
	Women	5.4	15.5	46.2	24.1	8.8	36.4	3.2	1.0	301
	Men	18.4	26.3	39.7	12.4	3.2	34.8	2.6	1.0	306

In 2009 a similar distributive pattern is found for the employed population (**Table 7**). The high rate of missing values has clearly been reduced compared to 2008, which can be assumed to be at least partly the result of methodological changes in the questionnaire.

Table 7: Summary Statistics on the Income Relative to the Reference Group. Reports for all nine referents the percentage of reports 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 reported for the employed based on the 2009 SOEP pretest module. Standard weights are applied to adjust for sampling bias.

2009	Referents	1	2	3	4	5	Miss.	Mean	Sd.	Obs.
	Partner	19.7	17.5	26.4	17.2	19.2	26.0	3.0	1.4	299
	Parents	11.2	14.7	25.8	27.1	21.2	24.0	3.3	1.3	318
	Friends	9.9	18.7	54.3	15.8	1.2	18.1	2.8	0.9	350
	Colleague	9.5	13.4	65.4	9.3	2.4	17.3	2.8	0.8	356
Employed	**Neighbors**	17.8	21.8	39.5	18.5	2.5	31.9	2.7	1.1	297
	Profession	8.1	16.0	67.4	6.6	1.9	18.5	2.8	0.8	359
	Age	10.5	22.7	43.1	21.7	1.9	26.2	2.8	1.0	321
	Women	7.8	16.6	41.5	26.2	8.0	24.7	3.1	1.0	329
	Men	21.0	22.0	39.2	16.0	1.7	24.5	2.6	1.1	330

Table 8 displays the difference in response rates between 2008 and 2009 for each reference group. The table reveals no clear reduction in missing values for the importance of reference groups; an overall decrease in missing values is observed for the relative income question. There was a reduction of more than 10 percentage points of missing values for comparisons with the same or the other gender and 6 to 7 percentage points for comparisons with neighbors and friends. Therefore, a clear improvement of the questionnaire was achieved on the relative income question.

Table 8: Comparison of Missing Values between 2008 and 2009 for the Employed Population. Results are reported in percent. Standard weights are applied to adjust for sampling bias.

	Referents	Importance of Referent			Income Relative to Referent		
		2008	2009	diff.	2008	2009	diff.
	Partner	7.0	7.5	**+0.5**	24.7	26.0	**+1.3**
	Parents	3.3	3.4	**+0.1**	28.3	24.0	**-4.3**
	Friends	1.8	2.2	**+0.4**	23.9	18.1	**-5,8**

Employed	**Colleagues**	4.3	2.9	**-1.4**	19.2	17.3	**-1.9**
	Neighbors	2.3	1.7	**-0.6**	39.7	31.9	**-7.8**
	Profession	1.6	2.2	**+0.6**	16.7	18.5	**+1.8**
	Age	1.5	1.4	**-0.1**	27.7	26.2	**-1.5**
	Women	3.0	2.7	**-0.3**	36.4	24.7	**-11.7**
	Men	3.2	3.5	**+0.3**	34.8	24.5	**-10,3**

Table 9 presents the results of the analysis of variance which tests differences in the mean values (a) between employed and non-employed (in 2008) and (b) between the years 2008 and 2009 (for employed individuals only). The table reports for each reference group the difference in means and its level of significance between the two groups based on Bonferroni test statistics. The parentheses indicate a violation of the necessity of equal variances and normal distribution (due to the Bartlett's-Test of Equal Variances).[4] Interpretations of these cases have to be treated with caution.

Table 9: Differences in Mean Values between Groups and Time. Reports levels of significance (***p<0.001; **p<0.01; *p<0.05) based on Bonferroni test statistics. Parentheses report violations of equal variances based on Bartlett's test of equal variance. Standard weights are applied to adjust for sampling bias.

	Non-employed vs. Employed (2008)		**2008 vs. 2009 (employed)**	
Reference groups	**importance**	**rel. income**	**importance**	**rel. income**
Partner	**(.39**)**	**(.39***)**	**(-.46**)**	-.07
Parents	-.13	**.31****	-.012	-.06
Friends	(.10)	**.18****	**(-.32**)**	.01
Colleagues	**(.87***)**	**.15***	**-.52*****	-.04
Neighbors	(-.01)	**(.37)****	(-.11)	-.10
Profession	**(.81***)**	.11	**-.47****	.01
Age	**(.32**)**	**.24****	**(-.34**)**	-.05
Women	(-.02)	**.44*****	.00	-.05
Men	(.03)	.16	.03	-.00

The results displayed in **Table 9** report clear significant deviations between non-employed and employed people in responses to the question on income relative to the following reference groups: parents, friends, colleagues, same age, and women. It is not surprising that non-employed individuals judge their income lower, relative to the average income, than the employed population.

[4] To test whether means differ significantly from each other, variances across groups have to be equal and normally distributed. Therefore Bartlett's Test of Equal Variance is applied to test for this precondition. Whenever there is no normal distribution within the groups, the test has to be interpreted in the light of the normal distribution hypothesis rather than that of equal variance. Other tests have been applied as well, e.g., Levene's and Brown's tests of equal distribution.

Further differences are observed for the importance of reference groups. However, the inequality of variance among groups does not allow any clear interpretation of the results.

No differences are observed between the two years of observation for income relative to certain reference groups. Nevertheless, differences in the reported relevance of group comparisons are apparent. A decrease in the average relevance of referents is reported for comparisons with colleagues and people working in the same profession. Results on the partner, friends, and people of the same age show an unequal variance structure across years and can therefore only be interpreted with caution.

In sum, the results indicate the need for separate analysis of response patterns for employed and non-employed persons. Fewer restrictions can be observed for analyses across years. Therefore, we suggest that analyses be based on a pooled set of data over the years when time dummies are implemented that control for differences in measurement and other unobserved biases between years.

3.3 External Validation

The technique of external validation is applied to test whether changes in reference group variables have severe consequences due to their interaction with other related variables that are fairly stable over time. Much is known about the correlation between reported income relative to various reference groups and objective measures of money and life satisfaction (Mayraz et al. 2009).[5] We expect positive correlations between relative income (compared to some reference group), absolute income (gross and net income), and life satisfaction. Further, we expect a shift in the correlations between 2008 and 2009. Due to the reformulation of the question in 2009 to focus on "gross income" rather than "income" in general (as it had in 2008), we expect higher correlations between the gross income and relative income in 2009 than in 2008.

Table 10 reports the correlation coefficients[6] between relative income and gross and net income as well as life satisfaction for the years 2008 and 2009. Surprisingly, no significant differences are observed in the strength of correlation between gross and net income. The coefficients deviate by a maximum of 0.03 points. Also the results on changes in correlations between years do not provide any further insights as to whether the questionnaire has improved. For net income, the decreases and increases in the correlation coefficients between years are slightly larger for net income than for gross income correlations. The highest gap (between years) is found for comparisons with people in the same age group: here the results show an increased correlation of 46%. For the other reference groups, an increase of between 0% (women) and 33% (parents) is observed. A decrease in the correlation is observed for personal income relative to people at work. The correlation between respondents' subjective evaluations of their income relative to co-workers and people in the same profession and their net and gross income decreases by between 6% and 18%. These findings indicate that changes in the wording of the question (especially the focus on gross income)

[5] However, we assume that this technique does not bear any advantage over measuring the importance of referents due to the lack in information on the relationship between external factors (e.g., social characteristics) and the reported importance of certain groups as referents.

[6] Due to the ordinal scaling of the relative income question, the Spearman's rank correlation coefficient has been selected.

did not improve the questionnaire.[7] Another interesting finding is given by the differences in correlations between relative income and life satisfaction.

Table 10: Correlations of Relative Income with Gross and Net Income and Satisfaction in 2008 and 2009. Reports Spearman's rank correlation coefficient for employed population and the percentage of change between the years of observation.

	gross income			net income			satisfaction		
	2008	**2009**	**change %**	**2008**	**2009**	**change %**	**2008**	**2009**	**change %**
Partner	**0.53***	**0.60***	*+13.2*	**0.53***	**0.62***	*+17.0*	0.03	0.08	*+16.7*
Parents	**0.29***	**0.36***	*+24.1*	**0.27***	**0.36***	*+33.3*	0.02	**0.23***	*+1050.0*
Friends	**0.40***	**0.53***	*+32.5*	**0.39***	**0.51***	*+30.8*	**0.20***	**0.19***	*-5.0*
Colleagues	**0.49***	**0.46***	*-6.1*	**0.50***	**0.44***	*-12.0*	**0.24***	0.16	*-33.3*
Neighbors	**0.53***	**0.57***	*+7.6*	**0.50***	**0.58***	*+16.0*	0.07	**0.28***	*+300.0*
Profession	**0.33***	**0.29***	*-12.1*	**0.34***	**0.28***	*-17.7*	**0.34***	0.09	*-73.5*
Age	**0.43***	**0.63***	*+46.5*	**0.43***	**0.63***	*+46.5*	0.17	**0.30***	*+76.5*
Women	**0.64***	**0.64***	*0.0*	**0.64***	**0.64***	*0.0*	**0.18***	**0.27***	*+50.0*
Men	**0.50***	**0.63***	*+26.0*	**0.51***	**0.64***	*+25.5*	**0.26***	0.14	*-46.2*

Table 10 (last column) reports significant correlations which vary widely in strength and stability over time. Friends and women are the only referents that prove to be significant over time; whereas income relative to the partner does not show any significant correlation with income over time. The highest positive increase in the strength of the correlation is found for income relative to parents and neighbors, but the correlation decreases significantly for income relative to people in the same profession, co-workers, and men. All correlations are positive, indicating the higher the income in comparison to some reference group, the higher the level of satisfaction.

[7] Biases due to differences in the non-response pattern for gross and net income cannot be excluded.

4 Identifying Personal Dispositions towards Social Comparison

Assessing the quality of instruments available to measure pay referents, one must take potential biases into account—for example, those that occur due to personal dispositions towards social comparison (Buunk et al. 2007). People with no disposition towards social comparison may either judge potential pay referents as irrelevant or not respond to the question as it is of no personal concern. Therefore, high rates of non-response and right-skewed response patterns may not indicate disapproval of the measurement instrument as such, but rather a personal disposition against social comparison. This issue also underscores the importance of integrating appropriate measurement instruments into large-scale population surveys.

This proposition also finds support in the current analysis using a proxy for the personal disposition. The descriptive statistics in **Table 11** report that a considerable amount of employed respondents (~20%) do not perceive any of the nine referents as relevant when evaluating their income. Further, the results show a slight decline in social comparisons in 2009 compared to 2008. This finding can be interpreted either as an artifact caused by changes in the questionnaire or an actual decrease in the importance of pay referents, which would strongly suggest the need for further research. No significant differences are observed for men and women.

Table 11: Distribution of Personal Disposition towards Social Comparisons. The reported percentage of respondents who perceived all nine reference groups as irrelevant and the percentage who saw at least some relevance in at least one of the nine reference groups. Results are displayed separately for women and men based on the SOEP pretest module 2008 and 2009 for the employed population. Standard weights are applied to adjust for sampling bias.

Pay Referents	Relevance	No Relevance
Women	80.5	19.5
Men	79.3	20.7
2008	84.0	16.0
2009	75.1	24.9

To get a more detailed understanding of the processes and individual differences in pay evaluations, proxies for personal dispositions have to be replaced by valid and reliable measurement instruments that provide a fuller picture of general dispositions towards social comparison. We strongly recommend the integration of approved measurement instruments in surveys like the Comparison Orientation Measure developed by Gibbons & Buunk (1999) (see Appendix).

5 Discussion and Outlook

The 2008 and 2009 SOEP pretest modules included two questions on pay referents. This paper documents the high quality of the two questions on pay referents in the 2008 module and their potential improvement through modifications in the 2009 module. The modifications that were made to the questionnaire in 2009 were meant to overcome the apparent difficulties respondents had had with the questionnaire in 2008. To test whether the questionnaire on pay referents improved, we make several comparisons—first, we compare the figures on employed and unemployed people in 2008; and second, we compare figures on the years 2008 and 2009 for the employed population only. The results on the measurement instrument point out following features:

(1) The summary statistics on the *relevance of reference groups* do not suggest any great improvement in the willingness to respond. The general trend to perceive reference groups as less relevant in 2009 than in 2008 cannot be clearly attributed to methodological effects. In contrast, the summary statistics on *income relative to those reference groups* show a clear improvement in the willingness to respond. On average, the response rate has risen 4.4%. However, the non-response within the employed population is still very high, at 23.5% on average. Therefore, with regard to response/non-response patterns, a clear improvement of the questionnaire can only be documented for the relative income question. Nevertheless, the high rate of missing values indicates either an effect of unobserved variables, e.g., a psychological disposition towards social comparisons, or a general uncertainty in answering such questions on the part of the respondent, e.g., due to the lack of information on the other's income. We recommend further analysis of the measurement instrument as well as the inclusion of control questions in the questionnaire, for example, on psychological dispositions (Gibbons & Buunk 1999; see Appendix).

(2) The results of the analysis of variance show remarkable differences in the variance between employed and non-employed persons, suggesting that the analysis should be split between the *employed* and the *non-employed*. Lower differences are observed for analyses across years. Nevertheless, analyses based on a *pooled set of data* should always control for time effects.

(3) Further, the *external validation of the relative income* question indicates that changes in the wording of the question (especially the focus on gross income) did not improve the questionnaire. This can be explained by the widespread lack of knowledge people have about other people's incomes. As a result, they have to estimate others' income based on their behavior (consumption, hobbies, and habits), at least when no other relevant information is available. It is fairly obvious that people think about and evaluate the income available for daily needs when asked these kinds of questions, and it seems likely that it is this net income that they compare with some group of others. Hence, it is questionable whether people are prone or even able to compare their *gross income,* and whether population surveys should instead focus on *net income*.

A questionnaire that asks respondents directly to make social comparisons is always in danger of being too cognitively demanding. Social comparisons are believed to be highly standardized and

subconscious psychological processes (Buunk & Mussweiler 2001). This increases the likelihood of a cognitive bias emerging within the response pattern. Being aware of these difficulties and biases is one step on the path to solving such problems. Nevertheless, further advances will have to be made in constructing and testing questionnaires that account for these processes and give an unbiased picture of comparison processes.

6 References

BLAU, G. (1994). Testing the Effect of Level and Importance of Pay Referents on Pay Level Satisfaction. *Human Relations, 47*, 1251–1268.

BUUNK, B. P., GROOTHOF, H. A. K., & SIERO, F. W. (2007). Social comparison and satisfaction with one's social life. *Journal of Social and Personal Relationships, 24*, 197–205.

BUUNK, B. P., & MUSSWEILER, T. (2001). New directions in social comparison research. *European Journal of Social Psychology, 31*, 467–475.

DUNCAN, O.D. (1975). Does Money buy satisfaction? *Social Indicators Research, 2,* 267-274.

GIBBONS, F. X., & BUUNK, B. P. (1999). Individual Differences in Social Comparison: Development of a Scale of Social Comparison Orientation. *Journal of Personality and Social Psychology, 76*(1), 129–142.

MAYRAZ, G., WAGNER, G. G., & SCHUPP, J. (2009). Life Satisfaction and Relative Income - Perceptions and Evidence. *SOEP Paper 214.*

SCHNEIDER, S. M. (in press). The Selection of Pay Referents. Potential Patterns and Their Consequences for Life Satisfaction. SoepPaper Series.

Schräpler, J.P. (2004). Respondent Behavior in Panel Studies: A Case Study for Income Nonresponse by Means of the German Socio-Economic Panel (SOEP). *Sociological Methods Research, 33,* 118-156.

Appendix: The Social Comparison Scale

The Iowa-Netherlands Comparison Orientation Measure by Gibbons & Buunk (1999) appears to be a promising instrument for measuring psychological dispositions towards social comparisons (see Buunk & Mussweiler 2001). The measurement supports the idea of individual differences in the orientation towards social comparisons and in how this information is processed. Gibbons and Buunk (1999) proposed a concept of social comparison orientation that captures the central aspects of the self, the other, and their interrelations. The core instrument contains 11 items. People are asked on a five-point scale ranging from A "I disagree strongly" to E "I agree strongly". The validity of the questionnaire has been tested in 22 questionnaires in the United States and the Netherlands. The instrument proved to be valid and consistent based on a wide range of validity checks.

Questionnaire

Most people compare themselves from time to time with others. For example, they may compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly "good" or "bad" about this type of comparison, and some people do it more than others. We would like to find out how often you compare yourself with other people. To do that we would like you to indicate how much you agree with each statement below, by using the following scale.

A B C D E

I disagree strongly I agree strongly

1. *I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing.*
2. *I always pay a lot of attention to how I do things compared with how others do things.*
3. *If I want to find out how well I have done something, I compare what I have done with how others have done.*
4. *I often compare how I am doing socially (e.g., social skills, popularity) with other people.*
5. *I am not the type of person who compares often with others. (reversed)*
6. *I often compare myself with others with respect to what I have accomplished in life.*
7. *I often like to talk with others about mutual opinions and experiences.*
8. *I often try to find out what others think who face similar problems as I face.*
9. *I always like to know what others in a similar situation would do.*
10. *If I want to learn more about something, I try to find out what others think about it.*
11. *I never consider my situation in life relative to that of other people. (reversed)*

Upward comparison subscale

1. *When it comes to my personal life, I sometimes compare myself with others who have it better than I do.*
2. *When I consider how I am doing socially (e.g., social skills, popularity), I prefer to compare with others who are more socially skilled than I am.*
3. *When evaluating my current performance (e.g., how I am doing at home, work, school, or*

wherever), I often compare with others who are doing better than I am.

4. *When I wonder how good I am at something, I sometimes compare myself with others who are better at it than I am.*
5. *When things are going poorly, I think of others who have it better than I do.*
6. *I sometimes compare myself with others who have accomplished more in life than I have.*

Downward comparison subscale

1. *When it comes to my personal life, I sometimes compare myself with others who have it worse than I do.*
2. *When I consider how I am doing socially (e.g., social skills, popularity), I prefer to compare with others who are less socially skilled than I am.*
3. *When evaluating my current performance (e.g., how I am doing at home, work, school, or wherever), I often compare with others who are doing worse than I am.*
4. *When I wonder how good I am at something, I sometimes compare myself with others who are worse at it than I am.*
5. *When things are going poorly, I think of others who have it worse than I do.*
6. *I sometimes compare myself with others who have accomplished less in life than I have.*

http://www.psychology.iastate.edu/~fgibbons/Iowa-Netherlands%20Comparison%20Orientation%20Measure%20(Social%20Comparison%20Scale).htm