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An Evolutionary Based Social Rank Explanation of Why Low Income Predicts Mental Distress: A 17 Year Cohort Study of 30,000 People

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Abstract

Background: This paper presents a new psychological model of why low income increases risk of mental distress. Consistent with evolutionary perspectives on disorder, income was predicted to relate to mental distress only through acting as an indirect proxy for social rank.

Methods: Participants were part of a longitudinal cohort sample of 30,000 people who were representative of the British population and who completed measures annually for up to 17 years. Mental distress was assessed via the General Health Questionnaire which measures anxiety, depression, and general functioning.

Results: Both income and the rank of the income within the region (and the rank of income within other comparison groups, such as similar individuals) predicted current and future distress. However, when distress was jointly regressed on income and income rank, only income rank remained a predictor.

Limitations: The outcome measure was self-report (although the predictor was objective).

Conclusions: The results support psychosocial rather than material explanations of why income relates to distress, and suggest that a concern for social rank is the mechanism through which these effects occur. This mechanism is consistent with an evolutionarily based "involuntary defeat syndrome" where hard wired responses to low social rank increase risk for disorder and the Decision by Sampling model of how people make relative judgments. Negative cognitions associated with low social rank (particularly defeat and entrapment) may be clinically targetable in both prevention and treatment programs to reduce socio-economic mental health disparities.

Keywords: RELATIVE INCOME, MENTAL HEALTH, DEFEAT, SOCIAL STATUS, SOCIAL CLASS, INEQUALITY, EASTERLIN PARADOX, RELATIVE RANK, DECISION BY SAMPLING

An Evolutionary Based Social Rank Explanation of Why Low Income Predicts Mental Distress: A 17 Year Cohort Study of 30,000 People

In trying to understand socioeconomic influences on mental distress, previous research has focused on low income as a robust and universal predictor (for reviews, see Lynch, Smith, Kaplan, & House, 2000; Muntaner, Eaton, Miech, & O'Campo, 2004; Subramanian & Kawachi, 2004; Wagstaff & van Doorslaer, 2000; Wilkinson & Pickett, 2006). Central to this literature has been a debate on whether the relationship between income and distress reflects the role of material factors (such as money's ability to purchase goods and services conducive to mental health) or psychosocial factors (such as low earners experiencing mental distress arising from their low socio-economic position, irrespective of the absolute amount of money they are earning) (Eibner, Sturm, & Gresenz, 2004; Kondo, Kawachi, Subramanian, Takeda, & Yamagata, 2008; Marmot & Wilkinson, 2001). Each position is still contentious and it is further not clear which psychosocial factors are most impacting on distress – whether, for example, people are influenced by how their income differs from the average person, the rank of their income within their community, or some other comparison. Identifying the most important psychosocial factors would help indicate the mechanism through which the effect operates.

We provide a direct test between the material and psychosocial explanations, with the aim of showing that income only relates to distress through acting as a proxy for social rank. We suggest that (adjusting for cost of living and other confounds) two people could earn the same amount of money in a rich and poorer region respectively, and the person who lives in the poorer region would have lower mental distress as their income would rank higher within the local community. Critically, this implies that controlling for the rank of person's income within the comparison group (a more direct proxy for social rank) would eliminate the relationship between income and distress. This social rank hypothesis would be consistent with a hard wired evolutionary mechanism linking low social position with mental distress.

Evolutionary explanations of non-psychotic mental distress suggested the existence of an "involuntary defeat syndrome" (IDS), representing a hard wired response to being of low social rank (see Taylor, Gooding, Wood, & Tarrier, 2011). In animals of low social rank it is adaptive to signal a "no threat" status to dominants, with behavioral manifestations including withdrawal, apathetic behavior, decreased appetite, decreased sexual behavior, and hypervigilance (Gilbert, 2006; Gilbert & Allan, 1998). This response to low social rank operates through moderating activity of serotonin, dopamine, and the hypothalamic-pituitary-adrenal (HPA) system. For example, serotonin inhibits the firing of neurons controlling an aggressive tailflip in crayfish at low social rank but enhances firing at high rank (Yeh, Fricke, & Edwards, 1996). In monkeys, exposure to dominance displays inhibits serotonin amongst those of lower rank (Raleigh, Mcguire, Brammer, & Yuwiler, 1984), with subordinates also having lower levels of D2 receptors (Grant et al., 1998). Thus social rank influences both the level of hormones and the effect of those hormones on behavior (for a full review of this literature, see Taylor, et al., 2011).

The behaviors caused by the IDS, which are adaptive for animals of low social rank, are also often present as symptoms of human affective disorders (e.g., withdrawal and apathetic behavior in depression, hypervigilance in anxiety disorders). Further, a wide variety of affective disorders have been linked to the functioning of serotonin, dopamine, and the HPA (Davidson, Pizzagalli, Nitschke, & Putnam, 2002). These observations have led to the transdiagnostic social rank model of mental distress, suggesting that the operation of the IDS underlies a wide range of disorder in humans (Gilbert, 2006; Gilbert & Allan, 1998; Taylor, Gooding et al., 2011). This model views these disorders as partially arising from the mis-regulation of a system that was adaptive in the evolutionary past. This system can be maladaptive as (a) low social rank can be chronic, whereas the IDS is most adaptive in dealing with short term situations, (b) modern societies have different needs than societies in the periods of early evolutionary adaptation (e.g., where severe physical injury from attacks by the social group were a greater possibility), and (c)

the development of human cognition allows greater rumination and exacerbating thoughts regarding social rank. Clinically, cognitions of defeat represent perceptions of being of a failed social rank, and feelings of entrapment represent the belief that there is no way out of the present situation (Gilbert, 2006; Gilbert & Allan, 1998). Generally, feelings of defeat and entrapment co-occur, operating as a negative downward spiral which can be activated by objective low social rank (Taylor, Wood, Gooding, Johnson, & Tarrier, 2009). Perceptions of defeat and entrapment lead to the development of disorder over time (Taylor, Wood, Gooding, & Tarrier, 2011) and are the mediating mechanism whereby a variety of risk factors impact on mental distress, including explaining why low social support and problem solving relates to disorder in community samples (Taylor, Wood, Gooding, & Tarrier, 2010) and why positive psychotic symptoms lead to suicidiality in people with schizophrenia (Taylor, Gooding et al., 2010).

Given that being of a low social rank is such a predictor of mental distress in both animals and humans, it seems plausible that low income may exert its effects on mental distress solely through acting as an indirect proxy for social rank. Despite this possibility having been previously noted (Brunner, 1997), and indeed highlighted as an essential "agenda for future research" (Subramanian & Kawachi, 2004), no previous direct test has been made of the social rank hypothesis (cf., Wagstaff & van Doorslaer, 2000). Using a longitudinal cohort study of 30,000 people completing measures each year for up to 17 we test whether (a) low income relates to increased mental distress cross-sectionally and increasing distress over time, and (b) whether when jointly regressing mental distress on income and income rank, income rank would remain a robust predictor whereas income would no longer relate to distress (suggesting that income only relates to distress through acting as a proxy for social rank).

Method

Participants

We analyzed data from the British Household Panel Survey (BHPS). This survey has been used widely and full information on the study is available elsewhere (British Household Panel Survey, 2010). Full ethical approval was obtained prior to the surveyors collecting data. Briefly, the BHPS is a nationally representative unbalanced panel survey, with responses collected annually between 1991 and 2008 (17 waves, generally ending in 2007, but with data collection finishing in 2008 for a minority of participants). Approximately 5,500 households were initially sampled in 1991, containing around 10,000 individuals. Individuals were re-contacted annually in successive years and if any individual left and entered a new household, other members of the new household were additionally sampled providing a total of 29,765 individuals that completed at relevant measures on at least one time point (totaling 195,752 separate observations as people completed measures for an average 6.57 years). Longitudinal analysis involved all individuals who completed measures for at least two consecutive time points (23,918 different individuals, 160,694 observations). The average age of the cross-sectional sample was 44.42 years (*SD* = 18.01), 54.3% were female, 72.9% owned their own house, 18.2% lived in social housing and the remaining 8.8% privately rented. Participants were interviewed in their homes, or over the telephone at their request. Overall attrition for most years was around 5% and it has previous been shown that attrition does not affect estimation results in the BHPS when studying health variables (Contoyannis, Jones, & Rice, 2004). We used multi-level modeling, developed in part to analyze unbalanced designs (Luke, 2004).

Measures

Psychological Distress

Psychological distress was assessed with the 12-item version of the General Health Questionnaire (GHQ, Goldberg & Williams, 1988). The GHQ assesses independently verifiable general non-psychotic psychiatric morbidity in the general population, with items primarily focusing on affective disorders particularly depression (Bowling, 2001). The GHQ comprises an

anxiety/depression factor (e.g., "thinking of self as worthless", "feeling unhappy and depressed") and a social dysfunction factor (e.g., "capable of making decisions" [reverse coded]) (Politi, Piccinelli, & Wilkinson, 1994) although the measure is scored according to a single higher order factor representing general psychiatric dysfunction (GHQ, Goldberg & Williams, 1988). Items are coded as to whether the symptom is absent or present with overall scores ranging from 0 to 12. The measure can be dichotomized at standard cut-off points to detect probable mental disorder with which coding it converges very highly with psychiatrists' ratings of mental illness (in a British Population: sensitivity = 84.6 and specificity = 89.4, Goldberg et al., 1997). Alternatively, it can be used as a continuous measure of psychological distress (Bowling, 2001; Goldberg & Williams, 1988). For the analysis reported here we adopt the continous coding, as this seemed more in fitting with the focus on the predicting general mental distress from income in community populations. However, all analyses were repeated using the cut-off points and all results remained the same (all significant variables remained significant at $p < .01$, and all non-significant variables remained so).

Income

Following standard practice, income was based on household income adjusted for household size to best represent each individual's spending power (and as this is the form of income normally studied in the previous literature). To reduce skew (and log-linear effects of income on distress) household income was log-transformed prior to analysis.

Income Rank

Three income rank variables were created for each individual, respectively representing the rank of their income within three different comparison groups, as more direct proxies for their social rank. The primary analysis used rank of the person's income within the region in which they lived, using the 19 geographical regions of the UK used in the BHPS (e.g., inner London, Outer London, Wales, etc.). This was on the assumption that people would compare

their social rank mostly to people around them. However, it is also possible that people compare their social rank to other people with similar characteristics. Two rank variables were therefore conducted, respectively representing the rank of the person's income amongst a comparison group of people with the same age (<20, 20-24, 25-29, 30-24, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69 and >70) and the person's income rank amongst a specially created 8 category comparison group of similar individuals, formed based on all permutations of education (university, college, school, and lower) and gender (e.g., pre-college female, pre-college male, etc.). Consistent results using different rank variables would increase confidence in the findings.

The analysis followed a method for studying income rank developed by the author elsewhere (Boyce, Brown, & Moore, 2010; Brown, Gardner, Oswald, & Qian, 2008). Each income rank variable was formed through the formula:

$$R_i = \frac{i-1}{n-1}$$

where an individual's income rank is determined by how many people have a lower income in the comparison group divided by the number of people in the comparison group. This provides a income rank variable normalized between 0 and 1.

Covariates

The distance from the mean of the reference group was controlled in all analysis, along with age, gender, education, marital status, housing ownership, labor force status and disabilities, and dummy variables identifying both survey wave and region (the inclusion of age, gender, education, and wave additionally controlling for different costs of living associated with being in certain comparison groups).

Statistical Analysis

As data were hierarchically arranged with years (Level 1) nested beneath individuals (Level 2) multi-level modeling was performed using the STATA statistical package (Luke,

2004). All analysis was conducted at Level 1 (Level 2 was included only to allow for clustering). Cross-sectional analysis thus represents the effect of the predictors averaged across individuals and each of the 17 years. For the longitudinal analysis, lagged models were tested, where GHQ at a given time point (t) was regressed on GHQ at t-1, and the t-1 predictors and covariates. Thus the longitudinal analysis tests whether absolute income, relative income, and relative position at a given time point predict how GHQ scores will change over the subsequent 12 month period (averaged across the 16 lagged years of analysis). As there were nine planned regressions, we used a conservative cut-off of $p < .01$ for all tests; power remained exceptionally high, as the multi-level analysis made use of approximately 195,752 and 160,694 observations for the cross-sectional and longitudinal analysis respectively (ensuring minimum power of .92 to detect .01% shared variance). The basic analysis involved jointly regressing GHQ scores onto both income and income rank (the moderate co-linearity being offset by the large sample size)..

Results

Cross-sectional Analysis

Several multi-level multiple regressions were conducted to predict GHQ scores, each including all covariates (see Table 1), based on methods previously developed to test between income and income rank (e.g., Boyce, Brown et al., 2010; Brown et al., 2008). Regression 1 shows that when GHQ was regressed on income alone, lower levels of income predicted higher levels of psychological distress, consistent with previous literature. In contrast, when GHQ was jointly regressed on income the rank of the income within the region (and other covariates) income rank was a predictor, whereas income was not (Regression 2). The covariates included a dummy variable representing region, age, gender, education, marital status, housing ownership, labor force status and disabilities, so the effects of income and income rank on mental distress cannot be attributed to differences on any of these variables. This effect was robust, with exactly the same result emerging for various comparison groups other than region; rank within age

(Regression 3) and within a comparison group of others with the same gender and education (Regression 4). The results suggested that cross-sectionally income only related to distress through its shared variance with income rank (consistent with the social rank hypothesis).

Longitudinal Analysis

Stronger evidence for a causal relationship between income rank and mental health would be given if income rank predicts future mental health. Further multi-level multiple regressions were therefore undertaken to test whether a person's income or ranked income position at a given time point could predict changes in psychological functioning over a 12 month period. The four regressions mirrored those used in the cross sectional analysis above, with the exception that the current analyses were lagged, where GHQ scores in a given year (t) was regressed on several predictors from the previous year (t-1), including previous GHQ score (to control for baseline functioning), all covariates, and (singly or jointly), absolute income, relative income, and ranked income.

The results are reported in Table 2, and perfectly mirror the cross sectional analysis. When GHQ was regressed on income alone, having a low personal income led to lower levels of psychological functioning over time (Regression 1). When GHQ was jointly regressed on income and income rank, only income rank was related to increasing mental distress over time (Regressions 2 to 4). The results provide support for a causal interpretation of the social rank hypothesis, and no support for direct effect of income on increasing distress.

Discussion

The results suggested that low income is only linked to distress through acting as an indirect proxy for social rank. The rank of a person’s income within a comparison group (such as region or people with similar characteristics) was a concurrent and prospective predictor of distress, and controlling for this variable, income was no longer related to distress. The effects

were observed both cross-sectionally and longitudinally, with a variety of differently defined comparison groups, and with other confounding factors controlled.

The results suggest a solution to a long standing controversy within epidemiology as to why income relates to distress (Subramanian & Kawachi, 2004; Wagstaff & van Doorslaer, 2000; Wilkinson & Pickett, 2006), and strongly support the role of psychosocial over material factors (cf., Marmot & Wilkinson, 2001). Showing that people are concerned with the rank of their income (rather than, for example, how their income differs from the average) is consistent with evolutionary perspectives of how low social rank underlies a wide range of disorder in both animals (Sapolsky, 2005) and humans (Gilbert, 2006; Gilbert & Allan, 1998; Taylor, Gooding et al., 2011). The results are also consistent with a large body of literature from cognitive science which suggests that all relative judgments are based on people's perceptions of the rank (ordinal) position of stimuli within a set (e.g., Stewart, Chater, & Brown, 2006; Wood, Brown, & Maltby, 2011). These two explanations are linked; if there is an evolutionary advantage to being concerned about social rank, then fast cognitive mechanisms to assess rank position would have been likely to arise. Equally, if rank based comparisons represent the most efficient cognitive mechanism to judge relative position, then it is likely that these mechanisms would have evolved, subsequently predisposing people to be sensitive to rank position (rather than, for example, distance from the mean, a comparison that would not be in line with inherent ways of information processing).

The results are consistent with findings observed by the previous literature. First, the social rank explanation would explain the previously observed curvilinear relationship between absolute income and psychological distress, where income is more strongly related to distress at lower income levels (about the bottom 20%) (Inglehart, Foa, Peterson, & Welzel, 2008). The dominant explanation is that income is needed more at lower levels and so leads to greater distress if it is not available (predicated on the assumption that it is the material effects of income

that relates to distress). However, this explanation cannot explain why within a society the same curvilinear relationship is seen in even the poorest countries in Africa (Howell & Howell, 2008); presumably here a lot more than 20% of people should need more income. Through showing that people are only concerned about the rank of their income, we can explain the shape of this relationship, and why it is invariant across different countries. In all societies income is positively skewed, with most people clustering at the lowest end of the income range. Thus at the bottom end of the range the $1000 dollars leads to a greater change in rank position than at the high end, thus leading to commonly observed effect of income being more related to distress at the lower end of the distribution. This effect would only be predicted by if people were sensitive to their social rank (rather than, for example, how their income differed from the average).

Second, the research is consistent with the positive relationship between income inequality and distress. Greater inequality within a society (e.g., the ratio of the highest to lowest earners) is linked to greater social problems (Wilkinson & Pickett, 2010) including greater mental distress (Pickett & Wilkinson, 2010; Wilkinson & Pickett, 2007). This literature suggests that people are influenced by psychosocial not material factors, as our results show, and further suggests that in more unequal societies there is a greater implicit message that monetary success is related to personal worth. Thus in unequal societies, a person's income rank may more naturally trigger the evolutionary based IDS, making our findings both consistent with the broader body of work on income inequality, and with animal research suggesting that hierarchy position has different effects on health depending on the composition of the society (Sapolsky, 2005). In more unequal societies, there will be also be a greater income difference between different income ranks (e.g., a $10,000 difference between the 50^{th} and 60^{th} rank, verses a $5,000 difference in a more equal society). This may make a person's income rank more distinctive and salient, again suggesting that there would be a greater link between income rank and distress in more unequal societies.

Third, income relates to well-being within a nation, but yet distress does not generally improve when the average income of that nation rises – the so called "Easterlin Paradox" (Easterlin, 1995; Inglehart et al., 2008). This would again be predicted if all people cared about was rank position, as if everyone's income rose equally, there would still be the same proportion of people at low ranks as before the increase, and these people would still experience greater mental distress. These observations suggest public policy implications of the present research. Governments aggressively pursue income growth, often explicitly or implicitly to increase the well-being of citizens. If the only impact was to raise everyone's income equally, this would have no impact on well-being. However, such policies often have the effect of increasing inequality. In this case such a policy would actually decrease well-being through increasing the likelihood of rank based comparisons, as apparently happens in less equal societies. Rather, if the aim is to increase well-being, policy makers would be better advised to decrease inequality or invest more money in mental health services. On a dollar by dollar basis, spending money on psychotherapy has been shown to be 32 times more cost effective at decreasing distress than increasing income (Boyce & Wood, 2010). The present research may help bolster arguments both for the creation of a more equal society (Wilkinson & Pickett, 2010) and for increasing state support for mental health services (Layard, 2006). Either approach would likely lead to greater decreases in national levels of distress than an approach simply aimed at increasing GDP.

The identification of why an effect occurs represents a first step towards developing prevention and treatment programs. Showing that income only relates to distress through acting as a proxy for social rank suggests which cognitions can be targeted to develop "resilience" to being of low income rank, in order to prevent disorder occurring (cf., Johnson, Wood, Gooding, & Tarrier, 2011). Similarly, these cognitions can be targeted in people with existing disorder to help recovery. The exact cognitions underlying the observed relationship will have to be tested in future research, but cognitions of defeat and entrapment appear to be the psychological

manifestation of social rank in all other cases (Taylor, Gooding et al., 2010; Taylor, Wood et al., 2010). Programs that target such cognitions may offer a psychological solution to reducing the link between income rank and distress, in addition to economic solutions aimed at creating a more equal society.

The research used objective measures of social rank rather than people's perceptions of their rank (which would likely differ). Future work should directly measure these perceptions as well as cognitions of defeat and entrapment. To an extent we were limited by the available data. However the use of all objective predictors had the advantage of avoiding problems with self-report (and particularly shared method variance), the overuse of which has been criticized in psychology. The use of all objective predictors will likely make the results more convincing for other fields such as economics and epidemiology where the use of such measures is near exclusive. The use of the GHQ outcome measure was an advantage in that this is the first study into the rank hypothesis in relation to disorder, and it was felt desirable to use a broad measure of dysfunction. The GHQ is one of the widely used measures of mental distress (Bowling, 2001) and has excellent psychometric properties, converging highly with psychiatrist ratings of mental disorder (sensitivity = 84.6, specificity = 89.4) (Goldberg et al., 1997). However, the GHQ has the limitation of being self-report and not indicating splitting down into sub-components representing specific disorders.

The present work has shown that income rank relates to general (predominantly affective) mental distress, future work should specifically test the hypothesis with regard to specific disorders, ideally using physician diagnosis. Additionally, future research should test whether social rank also influences the experience of positive emotions. Happiness appears to be on the same continuum as depression (Wood, Taylor, & Joseph, 2010), suggesting that the effects of income rank may not only influence functioning on the part of the continuum ranging from -10 (extreme depression) to 0 (no depression), but may also influence the part of the continuum

ranging to +10 (happiness). Other conceptions of well-being, such as "eudemonic" or psychological well-being (e.g., social relationships, autonomy, etc., see Joseph & Wood, 2010) are empirically distinguishable from affective functioning (Linley, Maltby, Wood, Osborne, & Hurling, 2009) and it is an open question whether income rank also effects these constructs. Ideally, future work would take a more holistic approach and consider the impact of social rank on both positive and negative functioning, in keeping with calls for a more integrated study of well-being (Wood & Tarrier, 2010).

The study was inherently multidisciplinary and it is hoped that the present research helps better integrate the fields of psychology with epidemiology and economics. This integration could enhance both fields through; (a) introducing psychological models such as social rank, perhaps for the first time, to epidemiological, medical, and economic fields, promoting the wider consideration of psychology in these disciplines, (b) increasing psychology's interest in epidemiological predictors of abnormal psychology, allowing greater influence on the public policy makers for whom these predictors are of considerable importance, and (c) promoting the use within psychology of advanced epidemiological and econometric methods and readily available (although highly underused) large publically available datasets containing psychological variables. Recent research is beginning this integration, particularly through showing that that psychological variables interact with key economic and epidemiological variables (e.g., Boyce & Wood, 2011; Boyce, Wood, & Brown, 2010); although clearly more interdisciplinary work is needed for the integration to be even partially successful.

Table 1

Summary of Four Cross-Sectional Multi-Level Regressions Predicting GHQ (*n*=203,556).

Regression Number	Predictor	*b*	*se*	99% CI(*b*)
1	Intercept	-0.350	0.149	-0.734,0.033
	Absolute Income	**-0.126***	0.011	-0.154,-0.098
2	Intercept	-0.696	0.360	-1.622,0.231
	Income rank by region	**-0.372***	0.054	-0.512,-0.233
	Absolute Income	-0.02	0.021	-0.056,0.052
3	Intercept	**-0.487**	0.164	-0.909,-0.065
	Income rank by age	**-0.277***	0.052	-0.412,-0.143
	Absolute Income	-0.036	0.021	-0.090,0.017
4	Intercept	-1.403	0.547	-2.812,0.006
	Income rank by education and gender	**-0.285***	0.049	-0.412,-0.158
	Absolute Income	-0.028	0.020	-0.080,0.024

Note: *CI*s not bounding zero indicate significant results (also starred and in bold); all regressions included demographic controls: age, gender, education, marital status, labor force status, distance from mean reference group income, and dummy variables identifying both region and wave.

Table 2

Summary of Four Longitudinal Multi-Level Regressions Predicting Changes in GHQ Over Time (n=171,211).

Regression No	Predictor	*b*	*se*	99% CI(*b*)
1	Intercept	0.227	0.173	-0.218,0.672
	Baseline GHQ	**0.242***	0.004	0.233,0.251
	Absolute Income	**-0.083***	0.014	-0.119,-0.046
2	Intercept	0.488	0.483	-0.757,1.733
	Baseline GHQ	**0.242***	0.004	0.233,0.251
	Income rank by region	**-0.397***	0.072	-0.582,-0.212
	Absolute Income	0.058	0.029	-0.017,0.133
3	Intercept	0.060	0.198	-0.451,0.570
	Baseline GHQ	**0.242***	0.004	0.233,0.251
	Income rank by age	**-0.288***	0.069	-0.465,-0.110
	Absolute Income	0.016	0.029	-0.058,0.089
4	Intercept	-0.266	0.750	-2.199,1.667
	Baseline GHQ	**0.242***	0.004	0.233,0.251
	Income rank by education and gender	**-0.310***	0.065	-0.478,-0.141
	Absolute Income	0.031	0.028	-0.041,0.103

Note: *CI*s not bounding zero indicate significant results (also starred and in bold); all regressions included demographic controls: age, gender, education, marital status, labor force status, distance from mean reference group income, and dummy variables identifying both region and wave.

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