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RESEARCH PAPER

Earnings, Intersectional Earnings Inequality, Disappointment in One's Life Achievements and Life (Dis)satisfaction

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Abstract

Most research investigating inequality as a moderator of the effect of income on wellbeing focuses on inequality within geographic contexts. This study asks whether the association of income with subjective wellbeing varies with level of inequality within groups defined by the intersection of dichotomized race (white versus non-white) and gender. Two dimensions of subjective wellbeing are investigated—life (dis)satisfaction, and disappointment in one's life achievements. Results of partial proportional odds and logistic regression analyses of data from the study of Midlife Development in the United States (MIDUS) indicate that the association of individual earnings with life (dis)satisfaction varies by level of inequality within intersectional groups. No evidence for moderation is observed in the analysis of disappointment. Within-group inequality varies much more by gender than race, and the results can be interpreted as indicating a gender difference in the effect of income on life satisfaction. The results are also consistent with the income rank hypothesis, which proposes that income effects will be larger among those in lower inequality groups than those in higher inequality groups. Although the statistical power to evaluate race differences is limited by the size and composition of the MIDUS sample, additional analyses suggest that the income-rank pattern might extend to race differences in (dis)satisfaction. The results can be broadly interpreted as suggesting that intersectional inequality does not influence the aspirations that provide the comparative standard for disappointment, but it does shape the way that the contemporaneous earnings differences relevant to life (dis)satisfaction are framed in social comparisons.

Keywords Inequality · Life satisfaction · Disappointment · Life achievement · Income · Intersectional

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1 Introduction

The association of personal and household income with subjective wellbeing has been found to vary with level of income inequality within nations and states (Cheung & Lucas, 2016; Macchia et al., 2020; Quispe-Torreblanca et al., 2021). Comparisons to compatriots, co-citizens, and locally proximal others (Zell & Alicke, 2010) are thought to underlie the moderating effects of geographic inequality on the income-wellbeing association. There are reasons to expect income comparisons to also be associated with the level of income inequality among demographically similar others, and to further expect inequality within demographically defined groups to moderate the effect of income on wellbeing. To date, studies of income inequality within groups defined by demographic characteristics such as age, race, and gender have not investigated that form of inequality as a moderator of income effects on wellbeing. Liao (2021) investigated whether geographic inequality moderates the effect of inequality within race and gender groups, but not whether within-group inequality moderates income effects.[1] This study investigates whether income inequality in groups defined by the intersection of race and gender moderates the association of income with two dimensions of subjective wellbeing—disappointment with one's life achievements, and overall life satisfaction. Data are from the study of Midlife Development in the United States (MIDUS) (Brim et al., 2004).

2 Background

2.1 Earnings Inequality at the Race-Gender Intersection

The investigation of inequality within groups defined by the intersection of race and gender is consistent with previous research (Liao, 2021), and with the literature on intersectionality (Choo & Ferree, 2010; Crenshaw, 2017; Degnen & Tyler, 2017; Ragin & Fiss, 2016). Although originally developed to support qualitative research on people in marginalized social locations, some quantitative researchers have adopted the language of intersectionality (Choo & Ferree, 2010) in studies of subjective wellbeing (Cummings, 2020). This involves the assumption of "… combinations of conditions as the default analytical starting point" (Ragin & Fiss, 2016, p 12). This study begins with the specification of four basic intersectional locations defined by the cross-section of two conditions, dichotomized race (white/not white), and dichotomized gender (men/women). Although social positions defined by the intersection of a pair of dichotomized variables pale in comparison to the rich complexity that the concept of intersectionality implies, race and gender are clearly

[1] In studying within-group "individual inequality" Liao (2021) used a measure he created called the iGini, or individual-level Gini. That measure, as well as Liao's iTheil measure, captures the contribution of the individual's income to within-group, between-group, and thus overall Gini/Theil scores. The within-group iGini resembles relative income to some extent, as can be seen in its numerator $\sum_{j=1}^{n} \left| x_i - x_j \right|$, which is the sum of the absolute value of deviations of each individual income from the incomes of all others in the group. The denominator $(2n^2\overline{x})$ scales the iGini to lie between 0–1. Like measures of relative income, the within-group iGini scores can vary among individuals in the same group. As noted below, the commonly used Theil index, rather than the iTheil (or iGini), is used to assess within-group income inequality in the current study, since the general Theil yields a single inequality value for the group that does not vary individually. This measure is preferable when considering inequality as a contextual factor that applies to all individuals within the same context or group.

associated with the distribution of socioeconomic resources (Cortés et al., 2022; Homan, 2019), and the way people react to their successes and failures (Beck-Werz & Fritz, 2022). Moreover, the investigation of inequality within a small number of groups defined by the intersection of race and gender helps to illustrate how ordering intersectional categories by level of inequality might permit analyses of greater complexity, and more intersectional categories, in future research.

2.2 Disappointment Versus (Dis)Satisfaction

The focus on disappointment in one's life achievements (DIOLA) in this study is unique. Like life dissatisfaction, disappointment can be considered a form of life evaluation. Yet disappointment is an emotional form of evaluation (Zeelenberg et al., 1998), while (dis) satisfaction is widely considered to be a cognitive form of evaluation (Busseri & Sadava, 2011). Moreover, DIOLA reflects evaluation of a narrower slice of life than does life (dis) satisfaction because life is comprised of more than one's achievements.

Multiple discrepancies theory (MDT) (Michalos, 1985) asserts that life satisfaction is influenced by many kinds of comparisons, including the comparison of what one currently has to what others currently have (i.e., social comparisons), and the comparison of what one has currently to what one had previously aspired to have. In contrast, DIOLA is tied only to the later form of comparison. The relative narrowness of the comparative standard of aspirations in evaluations that influence disappointment should make DIOLA more sensitive than life satisfaction to processes that shape aspirations. Indeed, one reason to study DIOLA is because it might more clearly indicate how aspirations and their attainment influence subjective wellbeing than does research on (dis)satisfaction.

Research and theory suggest that one reason to expect intersectional income inequality to moderate income effects on DIOLA and life (dis)satisfaction in different ways is because inequality could influence income aspirations in a different way than it influences direct contemporaneous income comparisons. Studies suggests that people draw upon their knowledge about the distribution of opportunities and resources currently available to them (Bourdieu, 2010; Oddsson, 2017), and thus their knowledge about inequality, in developing aspirations. Aspirations are thus tied to how people perceive, think, and feel about the economic opportunities that might be most open to them in the future. Among the MIDUS cohorts, the income aspirations that provide the base for comparisons are likely to have developed in early adulthood, which is when occupational aspirations tend to stabilize (Jacobs et al., 1991). Although only current intersectional inequality is assessed in this study, levels of income inequality are unlikely to vary much over time. Thus, current inequality might moderate the effect of income on DIOLA, and to some extent also (dis)satisfaction, because current intersectional inequality is strongly associated with earlier levels of inequality, which in turn influence the development of aspirations.

Since the overall level of income differences within an intersectional group provides the range of possible comparisons, current intersectional inequality is also directly relevant to the contemporaneous social comparisons that in theory influence (dis)satisfaction, but not DIOLA. The immediate discrepancy between what one currently has versus what others currently have is relevant to life (dis)satisfaction but not directly relevant to DIOLA because, as noted above, the comparative standard for DIOLA lies solely in aspirations formed earlier in life.

In addition to the temporal difference between aspirations and contemporaneous comparative standards, the moderating effect of inequality could differ across outcomes

because aspirations are likely to have a more complex relation to inequality than does the comparative standard of what others currently earn. For example, researchers have suggested that for many of the disadvantaged one consequence of coming to know one's place in society (Bourdieu, 2010; Oddsson, 2017) is the diminishment of aspirations. Diminished aspirations are thought to be associated with a "…generalized negative self-entitlement or a distorted sense of one's self as not deserving or worthy…" (Mackenzie, 2014: 60). Inequality could contribute to distorted self-conceptions of that sort because self-blame can stem from the individualization of failure, immobility, and downward mobility. Individualization of failure and mobility is fostered by neoliberal ideology. Neoliberal ideology is more pervasive in less equal settings than more equal settings (Goudarzi, et al., 2022; Ratner, 2019), and thus should dampen aspirations among the relatively disadvantaged in unequal settings more than in more equal settings. This dampening could result in the association between income and wellbeing being blurred when aspirations are the only comparative standard, as they are for DIOLA. Thus, income inequality might be a weaker moderator of the effect of income on DIOLA than on life (dis)satisfaction.

In sum, although previous inequality and current inequality are likely to be strongly associated with each other, they might have different effects on the formation of aspirations versus the framing of contemporaneous comparisons. These differences might be reflected in differences in the income-moderating effects of current inequality in analyses of DIOLA versus life (dis)satisfaction.

2.3 Previous Research on Income, Income Inequality, and Subjective Wellbeing

As noted above, most studies of income inequality have focused on inequality within places. Macchia et al. (2020) found the positive association between income rank and positive life evaluation to be significantly larger in countries where income inequality is higher than in countries with lower income inequality. They also found income rank to have a stronger association with subjective wellbeing than absolute income. Income rank was evaluated in that study relative to the total sample as well as rank relative to others of the same gender and age. Macchia et al. (2020) found little difference between results using each measure of rank.

In the study by Liao (2021) that investigated the association of unhappiness with the within-group iGini measure discussed above (see footnote 1), within-group inequality was found to have a moderately negative association with unhappiness in the least geographically unequal states, a slightly positive association in states with a medium level of inequality, and highly positive association in the most unequal states. That pattern of results suggest that the effect of within-group income inequality is larger in the context of greater geographic inequality.

However, the pattern of association seems to be different when income effects on life satisfaction are investigated. Quispe-Torreblanca et al. (2021) found income to have a larger effect on life satisfaction in low-inequality countries than in high income-inequality countries. They argue that this pattern makes sense from the perspective of the income rank hypothesis, which is based on the observation that each dollar increase in income moves an individual further up the relative income ladder in a more equal setting than it does in a less equal setting. The income rank hypothesis specifies that "…an individual's life satisfaction increases with the relative ranked position of their income within their society" (p.19).

Although geographic variation in inequality is not investigated here, the research presented in this report can be understood as falling into a conceptual and methodological space between the Macchia et al. (2020), Liao (2021) and Quispe-Torreblanca et al. (2021) studies. Some of those studies focused on inequality as a moderator of income effects. Unlike Liao (2021), who assessed the direct effect of race-gender intersectional inequality in the context of geographic inequality, in the current study the focus is on whether inequality in spaces defined by the intersection of race and gender moderates the effect of income on wellbeing.

2.4 Processes That Could Underlie Intersectional Income Inequality Effects

The social comparisons that are thought to motivate reactions to inequality and relative income could often be comparisons to others in the same geographic context (Zell & Alicke, 2010). However, not all comparisons are geographically constrained, and there is evidence that inequalities and comparisons to demographically similar others, regardless of geographic context, are also associated with subjective wellbeing, though through processes that differ from those that drive effects of geographic inequalities. Inequalities within geographic contexts are known to be associated with interpersonal mistrust, which can undermine other aspects of subjective wellbeing (Graafland & Lous, 2018), in part through between-group comparisons. For example, when groups are racially defined, between-group comparisons can contribute to group threat (Rios et al., 2018). Given the same level of inequality, racially similar neighbours, and similar others in general, might be less often perceived as posing the same types or levels of threat. In fact, some have argued that upward comparisons to demographically similar others can promote rather than undermine wellbeing (Collins, 1996; Liao, 2021: p 3; Ravazzini & Piekałkiewicz, 2019: p 157). That kind of effect might be even stronger when general characteristics such as race and gender identify potential role models because the success of such role models might signal broad levels of opportunity for one's demographic group. Thus, the ways income inequality among demographically similar others could influence wellbeing through social comparisons to generalized "others like me" (Miller et al., 1988) may be unique when "like me" is defined by demographic characteristics that feed into social identity (Stets & Burke, 2000).

Studies suggest that people tend to compare themselves to those who resemble them on a wide range of generalizable factors, and that those comparisons provide standards for hopes and expectations (Michinov & Michinov, 2001; Wood, 1989). Self-discrepancy theory and regulatory fit and focus theories (Higgins, 1987, 1998) further suggest that people are motivated to make comparisons to others to whom they perceive themselves to be similar because this helps them gain information about how to promote their successes and achievements or protect themselves against failures (lack of achievement). This is relevant because research on regulatory focus suggests that individuals who are more oriented toward self-promotion than self-protection might be especially susceptible to disappointment (Han et al., 2021: p. 6). Self-regulation could be more relevant to discrepancies from aspirations, and thus to disappointment than is (dis)satisfaction, which can arise from comparisons that are diretly and immediately framed by current inequality. In sum, multiple social and psychological processes are likely entwined with social comparisons in ways that could link relative income and intersectional inequality to DIOLA and life satisfaction in different ways.

3 Methods

3.1 Data

Data from respondents to the first wave of Midlife in the United States study (MIDUS), fielded in 1995–96 (Brim, et al., 2004), are analyzed for this report. Analyses focus on data from the primary respondents (i.e., excluding proxies, siblings and city oversamples) to the first wave of data collection because inequality scores must be calculated separately for each wave, and the second and third-wave samples have too few respondents to calculate stable inequality scores at those waves. The sample size for the wave-one analysis of satisfaction with life is n = 3021. There were slightly fewer respondents to questions about disappointment in one's life achievements. More respondents answered the telephone interview questions about DIOLA (n = 3010) than the mail questionnaire (mail n = 2988). The overall sample for descriptive statistics includes respondents to any of the three outcomes (n = 3034). Additional analyses of data from the third MIDUS wave (n = 1414), conducted in 2009, are presented in the appendix, as a robustness check. Wave-three data are used for the robustness-check analyses because a relatively smaller proportion of respondents are missing income data at wave-three than at wave-two.

3.2 Measures

3.2.1 Disappointment in One's Life Achievements

In both the telephone survey and mail questionnaire DIOLA is assessed by asking for level of agreement with the statement, "In many ways, I feel disappointed about my achievements in life." In the telephone interview, respondents are first asked, "Do you agree or disagree with this statement?" and then "Do you (AGREE/DISAGREE) strongly, somewhat, or only a little?" There is no middle response category provided in the telephone interview assessment. In the mail questionnaire the response scale presented includes a middle category labelled "don't know". Although the original response scale for DIOLA ranges from 1–7 in the mail questionnaire and 1–6 in the telephone interview (given that the middle response category was eliminated), scores are collapsed into four ordinal categories for these analyses. This is because some of the scale values received a low frequency of endorsement, resulting in estimation problems (negative predicted probabilities) when all ordinal categories were included in the analyses (see below). For example, too few respondents said they agreed "strongly" that they suffer from this form of disappointment to retain that as a distinct response category in the analyses, so strong agreement is combined with agreeing "somewhat." The middle categories were also endorsed at low prevalence and are therefore also collapsed. Thus, four levels are coded: (1) strong disagreement that one is disappointed, (2) disagreeing somewhat that one is disappointed, (3) the middle categories of "don't know," agreeing "a little," or disagreeing "a little," and (4) agreeing strongly or somewhat that one is disappointed.

3.2.2 Life (Dis)satisfaction

Life Satisfaction is assessed in the telephone interview by asking: "At present, how satisfied are you with your life? Would you say a lot, somewhat, a little, or not at all?"

Responses are coded sequentially as listed (1–4), with the highest score indicating "not at all" satisfied. Thus, higher scores indicate more dissatisfaction. As noted below, additional analyses focus on the highest reported level of life satisfaction.

3.2.3 Individual Earned Income and Relative Income

Respondents were asked to report income in the "past 12 months" from several sources. One question asked respondents to report "…wages and other stipends from your own employment." Household social security income (SSI) was also assessed, providing additional information about income for an additional 21 cases who were missing on employment income. Half of the household SSI income is attributed to the respondent if both the respondent and spouse are age 60 and older and report that they are retired. In cases where only the respondent or spouse is age 60 or older and retired, the SSI income is attributed fully to that person. SSI is considered earned income it is based on contributions respondents made while employed (Steuerle & Caleb, 2019). The combination of earned income from the two sources is top-coded at $250,000.

The income data are used to construct a measure of income percentile rank (i.e., from 1 to 100), as in previous research (Ball & Chernova, 2008; Stranges et al., 2020). Consistent with Macchia et al. (2020), preliminary analyses reveal relative income to have a stronger relationship to satisfaction and disappointment than absolute income. The association of relative income with each outcome was observed to be linear. For brevity, relative income is often referred to below simply as income.

3.2.4 Inequality of Earned Income (IEI) Within Groups Defined by Race and Gender

Income inequality is assessed separately for the four intersectional positions defined by dichotomized race and gender (white/non-white; men/women) for all primary respondents at each wave. A Stata program called ineqdeco (Jenkins, 2008) provides the Theil index for each intersectional group.[2]

Income inequality is assessed within only the four groups defined by the intersection of dichotomized race and gender because intersectional locations defined by more differentiated racial categories (see below), or locations defined by more variables (e.g., by considering age and marital status as well as gender, education, and race), would be subject to bias due to group size. Breunig and Hutchinson (2008) state that bias in inequality indices increases as sample size falls below 100, and the four race-gender categories (i.e., locations) were selected because they each contain more than 100 cases. Theil index values for the four locations within which inequality is assessed are as follows: (a) White Men 0.39 (n = 1194), 4.5% reporting zero personal income; (b) Non-White Men 0.32 (n = 211), 6.6% reporting zero income; (c) White Women 0.59 (n = 1224), 16.3% reporting zero income; (d) Non-White Women 0.53 (n = 261); 18.4% reporting zero income. Many more women report zero personally earned income than men, which is one reason why income inequality is much higher among women than men.

The similarity in Theil index values for whites and non-whites is not optimal for differentiating among race-related locations. However, in the wave three analyses, shown in

[2] Income is transformed by adding 1 before calculating Theil index scores. The Theil index calculating formula is SUM f_i (y_i / m) log(y_i / m), where i indexes each case, y = income, m = mean of income, and f_i is the fraction of the population with each income (w_i) given by f_i = w_i / N.

the appendix, the Theil index value for white women (IEI = 0.48) differs substantially from the value for non-white women (IEI = 0.62). This suggests that inequality increased among non-white women with age but dropped among white women.

3.2.5 Control Variables

Age, race, gender, education, marital status, two measures of self-reported health, and a measure of religiosity are included as control variables. Race was assessed in the mail questionnaire by asking, "What are your main racial origins—that is, what race or races are your parents, grandparents, and other ancestors?" as well as the question, "What race do you consider yourself to be?" Respondents are coded as white (78% in the analytic sample for life dissatisfaction) if they indicated they are white on either of these questions consistently across all study waves. All others are coded as non-white. Race is dichotomized because there are too few non-white respondents to estimate inequality for more specific non-white groups. The largest non-white group is comprised of those who report inconsistent race across waves or label themselves multiracial or "other" in at least one wave (15.2%). About half as many respondents in the sample for life dissatisfaction (7.1% in the life satisfaction analytic sample) consistently identify as black. Other racial groups are represented at low frequency: Asian or Pacific Islander (1.1%), Native American or Aleutian Islander (0.8%), and missing data on race (1.7%), in the wave-1 sample.

Education level was assessed in the telephone interview at each wave by asking, "The next questions are for classification purposes. What is the highest grade of school or year of college you completed?" Responses are coded into twelve categories ranging from (1) some grade school to (12) PH.D., ED.D., MD, DDS, LLB, LLD, JD, or other professional degree. Preliminary analyses suggested that education could be treated as a continuous variable.

Current marital status is assessed by the question, "Are you married, separated, divorced, widowed, or never married?" The currently married serve as the contrast group in the analyses reported here, with separate indicators of never married, divorced/separated (combined), and widowed.

Religiosity and health are added as controls on the advice of a reviewer who noted that the work of Easterlin (2021) and others indicates that those variables strongly influence both subjective wellbeing and income. Religiosity is assessed in the mail questionnaire by asking "How important is religion in your life?" The original response scale (1 = "very" to 4 = "not at all") is reversed for these analyses.

One of the health measures included as a control is self-reported physical health assessed in the phone interview by asking, "In general, would you say your physical health is…" with a scale ranging from 1 = "poor" to 5 = "excellent" provided. The other measure is of self-rated heath compared to others, assessed by the item, "In general, compared to most (men/women) your age, would you say your health is…" with a response scale of 1 = "much better" to 5 = "much worse". That scale is reversed in these analyses so that for both measures higher scores indicate better self-rated health.

3.3 Analytic Approach

It is unusual to have access to survey measures of a single construct assessed in different ways at roughly the same time. Thus, the analyses of DIOLA begin with a description of

the distribution of DIOLA scores across survey modes, and by describing the association of both measures of DIOLA with life satisfaction.

Partial proportional odds' (PPO) models (Williams, 2006) are then estimated for each outcome, first without multiple imputation (see Online Appendix A), to determine the pattern of non-proportional effects, and then with imputation. Multiple imputation is necessary because of data is missing for the health and religiosity control variables. Data for earned income is also missing for 143 respondents in the life satisfaction sample, with slightly fewer missing cases in the DIOLA analyses, but that level of missing data (< 5%) is typically assumed to have little effect on estimates (Madley-Dowd et al., 2019).

For the baseline analyses, non-proportional effects are noted at the bottom of the table. In the subsequent tables, including those in the appendices, a single coefficient is presented when estimates do not differ across levels of the outcomes (i.e., when effects are "proportional"), and otherwise different coefficients for transitions among different ordinal levels of the dependent variable are presented. As noted above, analyses from logistic regressions of dichotomized life satisfaction, predicting the highest level of satisfaction, are also presented because those results summarize the findings and are based on a relatively large number of cases at each level of the dependent variable for each intersectional group. Analyses are conducted using the population weights for the joint phone and mail sample.

4 Results

4.1 Descriptive Analyses

Distributions of all study variables are presented in Table 1, and correlations among the central analytic variables are presented in Table 2. All tables and figures reproduced for wave-three data are presented in Online Appendix B. Table 1 shows the mean level of DIOLA to be lower in the phone assessment than the self-administered questionnaire assessment. Recall that the former excluded the middle category and employed an unfolding pattern of questioning. The higher score on the mail questionnaire could reflect a stronger tendency for people to avoid agreeing with the statement used to assess disappointment by choosing the middle category when given the option. However, other factors could also influence inconsistency in DIOLA reports across survey modes, including effects of events that occurred between the two assessments. Although the 0.49 correlation between the two DIOLA measures is relatively high, it is not as high as one might expect for two measures of the same construct assessed at roughly the same general time.

Except for the correlation of intersectional income inequality with life dissatisfaction, all correlations in Table 2 are statistically significant ($p < 0.05$). The correlation of intersectional (race-gender) inequality with life satisfaction is of borderline statistical significance ($r = 0.04$, $p < 0.10$).

4.2 Preliminary Analyses of DIOLA Discrepancies

Given the less than perfect association between the two measures of DIOLA, preliminary analyses were conducted to investigate whether differences in response across survey mode are predicted by the variables in these analyses. Analyses focused on those reporting the lowest level of dissatisfaction in the phone assessment and the highest level in the mail assessment (n = 168, 5.6% of those who answered both), and vice versa (n = 40, 1.3%

Table 1 Description of variables

	Mean/%	SD
Age (range 20–75)	47.6	13.1
Male	48.5%	
Race: White	77.9%	
Black	6.9%	
Other	15.2%	
Educ. Level (range 1–12)	6.7	2.5
Income (range $0–$250,000)	27,319	31,546
Income percentile	48.1	28.8
Marital status		
Married	65.3%	
Div/sep	22.2%	
Widowed	0.8%	
Never married	11.7%	
Religion important	3.1	0.9
Physical health	3.5	1.0
Comparative health	3.7	0.9
Income inequal:		
Race × gender	0.5	0.1
Disappointment phone	2.0	1.2
Disappointment mail	2.5	1.1
Life dissatisfaction	1.5	0.7

Sample size for most variable is n = 3034, defined by cases contributing data at any wave. Due to missing data (imputed in later analyses) exceptions to that denominator are as follows: Income and Income Inequality n = 2890. Importance of Religion n = 2957, range 1–4, Physical Health n = 3032, Comparative Health n = 2957, range 1–5

Table 2 Pairwise correlations among central analytic variables

	1	2	3	4	5
Earned income					
Percentile inc. total	0.79				
Inc. inequality race-gender	−0.31	−0.36			
DIOLA phone	−0.16	−0.17	0.05		
DIOLA mail	−0.16	−0.17	0.08	0.49	
Life Dissatis	−0.10	−0.10	0.04	0.36	0.33

Correlations among ordinal variables are Spearman, all others are Pearson

of those who answered both). Logistic regression analyses of those extreme differences in response across modes included the same baseline predictors as in Table 3. Results revealed education to be the only variable significantly associated with those shifts. The estimated education effect was the same in both directions. A one ordinal unit increase in education level (see education coding above) is associated with 0.1 reduction in the odds of answering in the polar-opposite direction in the other mode ($p < 0.05$). This suggests that

those with less education change their DIOLA ratings more across assessment method than those with more education. Since the mail assessment requires reading and understanding the response scale, one plausible interpretation is that some of those shifts involve errors in interpreting the response scale on the mail questionnaire. To evaluate this, all models were re-estimated with the polar-opposite response cases excluded. The coefficients produced by those analyses are nearly identical to those reported below which were estimated without the exclusions, and the pattern of statistical significance is the same in the two analyses. For example, the coefficient for the interaction between income rank and income inequality in the analysis of phone-assessed DIOLA (level-1) is b = 0.01, se = 0.02, $p > 0.10$, both in the analyses of all cases, and in analyses that exclude cases who responded in the polar-opposite pattern.

4.3 Main Effects Estimates

Before evaluating the main hypothesis that the association of individual earnings with DIOLA and life satisfaction is moderated by intersectional earnings-inequality, PPO models of the direct effects of all individual-level variables on each outcome are estimated. Table 3 presents those estimates with multiple imputation for missing data (Royston & White, 2011). Most of the missing data are for the control variables of religiosity and the two health variables. Results from analyses that exclude versus impute missing data are very similar, and patterns of statistical significance of all central analytic variables are the same.

Analyses of multiply imputed data occur in two steps. At the first step, values for the independent variables where data are missing are imputed, and 30 imputation datasets are produced. The imputation models include age, education, marital status, the weight variable, and the measure of life satisfaction. Income is imputed using predictive mean matching since its distribution is non-normal. The other variables are imputed using ordered logistic regression.

The second step involves model estimation using the data produced at the first step. Two models are estimated for each outcome. The first is a "baseline" model that includes only income, age, gender, race, education, and marital status. The second model includes controls for health and religiosity. Those variables are added at a second step since they are more likely than the variables in the baseline model to be consequences or mediators of income effects on each outcome, rather than antecedents. Non-proportional effects, indicated by significant gamma scores (Peterson & Harrell, 1990), are identified in footnotes, and the results showing non-proportional effects of control variables are presented in Online Appendix C.

Both the baseline and extended control models include interactions between control variables. Those interactions were revealed as significant in preliminary analyses in which quadratic effects of age, education and relative income were also evaluated (none was significant). Graphs of those interactions are presented in Online Appendix D. Those graphs show that for both men and women the disappointment level decreases with rising education, and the negative effect of education on disappointment is stronger among women than men. This consistency is remarkable given the surprisingly weak baseline correlation between the two DIOLA measures. In the analysis of life satisfaction, the estimated effect of age is stronger among men than women, with older men being much more likely to report that they are satisfied with their life "a lot" than younger men. The age-trend for women is much less pronounced but in the same direction. Although the analyses of

Table 3 Estimated effects of individual-level factors on disappointment in life achievements and life satisfaction from partial proportional odds models. Multiple imputation results

	Baseline model			Baseline + controls		
	Disapp. phone (n = 3010) b se	Disapp. mail (n = 2988) b se	Life dissatis (n = 3021) b se	Disapp. phone (n = 3010) b se	Disapp. mail (n = 2988) b se	Life dissatis (n = 3021) b se
Age(log)	0.31	−0.16	−1.48***	0.23	−0.27	−1.59***
	(0.32)	(0.3)	(0.42)	(0.33)	(0.31)	(0.44)
Male	−0.46*	−0.61**	2.87**	−0.49*	−0.64**	3.27**
	(0.22)	(0.22)	(1.01)	(0.23)	(0.22)	(1.05)
White	−0.11	0.16	−0.08	−0.08	0.2*	−0.06
	(0.09)	(0.09)	(0.1)	(0.09)	(0.09)	(0.1)
Education	−0.21***	−0.18***	−0.07***	−0.18***	−0.16***	−0.04*
	(0.03)[a]	(0.02)[a]	(0.02)	(0.03)[a]	(0.02)[a]	(0.02)
Div/sep	0.04	0.23**	0.18	0.00	0.19*	0.13
	(0.09)	(0.09)	(0.1)	(0.1)	(0.09)	(0.1)
Widowed	−0.73	−0.19	−0.01	−0.96	−0.38	−0.35
	(0.59)	(0.42)	(0.56)	(0.58)	(0.43)	(0.61)
Never Marr	0.18	0.03	0.46***	0.17	0.12	0.47***
	(0.15)	(0.14)	(0.13)	(0.16)	(0.13)	(0.13)
Male x Educ	0.07*	0.07*		0.07*	0.07*	
	(0.03)	(0.03)		(0.03)	(0.03)	
Male x age(log)			−1.77**			−2.06***
			(0.61)			(0.64)
Phys.Hlth				−0.35***	−0.32***	−0.44***
				(0.06)[a]	(0.05)	(0.05)
Comp. Hlth				−0.11	−0.1*	−0.23***
				(0.06)[b]	(0.05)	(0.05)
Religiosity				−0.03	−0.1*	−0.2***
				(0.06)[b]	(0.04)	(0.05)
Inc %-tile	−0.01***	−0.01***	−0.02***	−0.01***	−0.01***	−0.01***
	(0.002)	(0.001)	(0.003)[c,e]	(0.002)	(0.002)	(0.003)[c,f]
Constant 1	0.95	2.24***	2.59***	2.82***	4.02***	5.41***
	(0.56)	(0.55)	(0.72)	(0.62)	(0.57)	(0.76)
Constant 2	0.22	1.86***	0.9	1.73**	3.6***	3.55***
	(0.57)	(0.55)	(0.73)	(0.64)	(0.57)	(0.76)
Constant 3	−0.46	0.07	−0.19	1.33*	1.73**	2.41**
	(0.57)	(0.55)	(0.74)	(0.65)	(0.58)	(0.77)

Effects are proportional unless noted

Non-proportional effects are indicated by a-e. For non-proportional effects the contrast between the first and second versus the third and fourth levels of the dependent variable (level 2 contrast) is presented above in the table

Other contrasts are labelled: (1) level 1 versus 2–4, and (3) levels 1–3 versus 4

[a]Effect is statistically significant and in same direction but of different magnitude for all other contrast lev-

Table 3 (continued)

els

[b]Effect is statistically significant & same direction in same direction at level (1), in same direction but not significant level (3)

[c]Effect is statistically significant & same direction in same direction at level (3), and in same direction but not significant level (1)

[e]Effect at contrast level (3) = −.02, se = .0005, $p < .001$. Effect at contrast level (1) = −.003, se = .002, n.s

[f]Effect at contrast level (3) = −.02, se = .005, $p < .001$. Effect at contrast level (1) = −.000, se = .002, n.s

*$p < .05$; **$p < .01$; ***$p < .001$

control variable effects are not motivated by theory and research about effects of age (Bartram, 2021) or other control variables, future studies of the effects of variables treated as controls here might further investigate those interactions.

The results indicate that increasing income is associated with decreasing levels of both disappointment and dissatisfaction. The effect of income on DIOLA is proportional, but income has a non-proportional effect on life satisfaction (indicated by the subscripts next to the standard error). The coefficient for the income effect in the main body of the table is for the "level-2" comparison, which is the contrast between the first two levels and the next two levels of dissatisfaction (i.e., between the odds of reporting "somewhat" versus "a little" satisfied). Details about the non-proportional effects are provided in the notes at the bottom of the table. Footnotes e and f state that income reduces the odds of reporting that one is "not at all satisfied" versus all other levels (i.e., the "level-3 contrast) in both the baseline analyses and the analyses including controls for health and religiosity. However, the level-1 contrast, comparing the income effect across the lowest level of dissatisfaction to all others, is not significant. However, that level-1 contrast emerges as important when the interaction between relative income and intersectional income inequality is considered.

The direct effects of intersectional earning inequality (labelled "IEI_RG") on each outcome are estimated by adding that measure to each of the models in Table 3. None of the estimates is close to statistically significant, so those results are not shown. The central hypothesis with respect to income inequality, though, is that it will moderate the effect of income.

4.4 Does Intersectional Earnings Inequality Moderate the Effects of Personal Income?

The interaction between intersectional earnings inequality within groups defined by race and gender (labelled IEI_RG in Table 4) and relative earned income, is estimated under both the baseline model (M1) and model with all controls (M2), for all three dependent variables. The results of analyses of the two DIOLA measures are not shown because the interaction effect is not close to statistical significance. In contrast, the results from the life dissatisfaction analyses indicate that intersectional income inequality does moderate the association of relative income with life satisfaction. That interaction, estimated with both PPO and logistic regression models, is shown in Table 4.

In the PPO analyses, coefficients for the interaction between inequality and income increase in magnitude across levels in each model but are statistically significant at only the highest and lowest levels in the baseline model, and only at the highest level in the model with extended controls. The lack of statistical significance at the middle level could reflect

Table 4 Estimated Effects of Relative Earned Income and Intersectional Income Inequality on Life Dissatisfaction and Satisfied "a Lot". Results from Multiple Imputation Analyses (n = 3021)

	Life dissatisfaction (PPO results)		Satisfied a lot (Logistic regression results)	
	b	b	b	b
	se	se	se	se
Age(log10)	−1.42***	−1.52***	1.37**	1.52**
	(0.43)	(0.45)	(0.46)	(0.48)
Male	5.80**	6.00***	−6.03***	−3.57***
	(1.38)	(1.42)	(1.45)	(1.2)
White	−0.09	−0.78**	0.83**	0.06
	(0.11)	(0.29)	(0.29)	(0.11)
Education	−0.07***	−0.03 +	0.07***	0.04 +
	(0.02)	(0.02)	(0.02)	(0.02)
Divorced/sep	0.17 +	−0.09	−0.16	−0.1
	(0.1)	(0.1)	(0.1)	(0.1)
Widowed	−0.04	−0.37	0.15	0.51
	(0.55)	(0.61)	(0.49)	(0.53)
Never married	0.42***	0.42***	−0.47***	−0.46**
	(0.13)	(0.13)	(0.14)	(0.15)
Physical health		−0.43***		0.43***
		(0.05)		(0.05)
Comparative health		−0.23*		0.21***
		(0.05)		(0.05)
Religiosity		−0.20*		0.22***
		(0.05)		(0.05)
Male × Age(log)	−1.98**	−2.22***	2.13**	2.29***
	(0.62)	(0.64)	(0.65)	(0.68)
Rel. $, Non-Prop.:				
levels 1 vs. 2–4	−0.02*	−0.01	0.02*	0.02 +
	(0.01)	(0.01)	(0.01)	(0.01)
Levels 1–2 vs. 3–4	−0.05**	−0.04*		
	(0.02)	(0.02)		
Levels 1–3 vs. 4	−0.1**	−0.09*		
	(0.04)	(0.04)		
IEI (R_G)IEI (R_G)				
Levels 1 vs. 2–4	13.2*	12.91*	13.21*	1.75
	(5.4)	(5.55)	(5.56)	(2.38)
Levels 1–2 vs. 3–4	11.20*	11.03		
	(5.6)	(5.77)		
Levels 1–3 vs. 4	8.49	8.23		
	(5.93)	(6.19)		
IEI(R_G) × Rel. $				
levels 1 vs. 2–4	0.04*	0.03	−0.04*	−0.03 +
	(0.02)	(0.02)	(0.02)	(0.02)
Levels 1–2 vs. 3–4	0.07 +	0.06		
	(0.04)	(0.04)		

Table 4 (continued)

	Life dissatisfaction (PPO results)		Satisfied a lot (Logistic regression results)	
	b	b	b	b
	se	se	se	se
Levels 1–3 vs. 4	0.16*	0.16*		
	(0.08)	(0.08)		
Constant 1	−4.22	−1.26	4.32*	−6.13***
	(2.83)	(2.92)	(2.93)	(1.53)
Constant 2	−4.93	−2.20		
	(2.91)	(3.03)		
Constant 3	−4.72	−1.98		
	(3.09)	(3.24)		

Levels in PPO analyses refer to contrasts on the dependent variable which is coded from 1 "satisfied a lot" to 4 "not at all satisfied"

The logistic regression is based on a reverse coding of of the first level contrast

Rel. $—Relative Income within groups defined by the cross-section of education and marital status

IEI (R_G)—Income inequality within groups defined by race (white versus non-white) and gender

IEI(R_G) x Rel. $—Interaction between relative income and income inequality

$+p<.10$; $*p<.05$; $**p<.01$; $***p<.001$

ambiguity among the middle level categories of the satisfaction response scale (i.e., the difference between reporting being "somewhat" versus a "a little" satisfied).[3] The inclusion of controls for health and religiosity reduces the estimated magnitude of the focal interaction, but only at the lower two levels. The level-3 coefficient remains statistically significant and largely unchanged in magnitude after the additional those controls. The stable and significant level-3 interaction effect suggests that increasing income increases rejection of the statemen that one is "not at all" satisfied more among those in the lower inequality intersectional groups than those in the higher inequality groups. Black and white men constitute the former, while black and white women constitute the latter. However, a relatively small number of respondents report dissatisfaction to that extreme (i.e., being not at all satisfied with life). Thus, the additional logistic regression analyses of dichotomized satisfaction focus on the other end of the continuum (i.e., level-1, or the contrast between those being "satisfied a lot" and all others).

The results from the full model with all controls are graphed in Figs. 1 and 2. The user-written mplotoffset module (Winter, 2017) is used to shift plotting points to better display

[3] Additional analyses excluding respondents who were not currently working were conducted. In that analysis of 2199 cases (see Appendix E), a similar ascending pattern of coefficients for the interaction term was observed. However, the level-3 coefficient was substantially larger than in the main analyses (b = 0.23, se = 0.06, P < 05). This suggests that moderation of income effects by intersectional inequality on reporting the highest level of life dissatisfaction might be particularly evident among current workers.

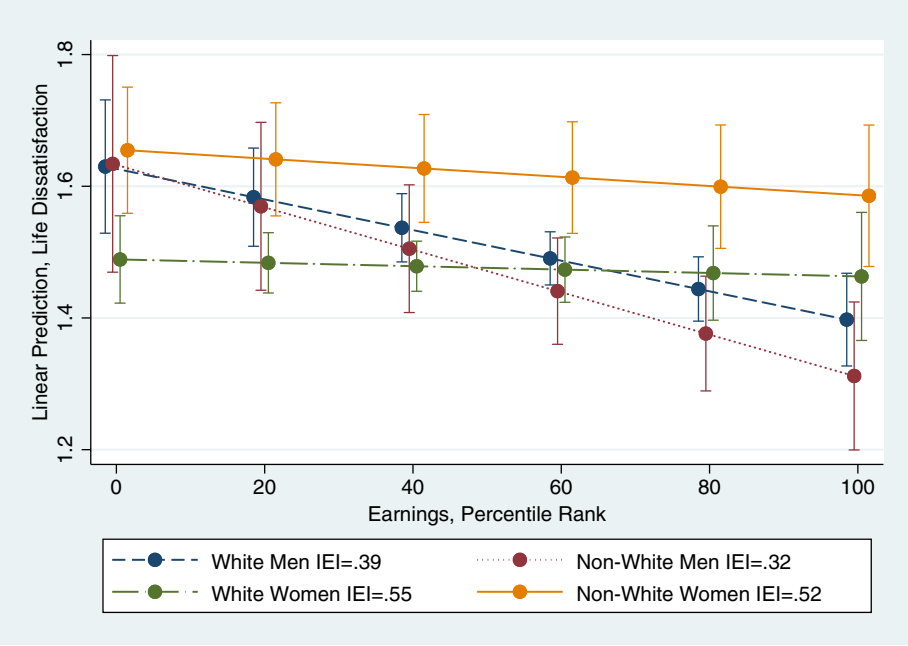

Fig. 1 Association of earnings rank with life dissatifaction level

confidence intervals. Figure 1 shows results for level of life dissatisfaction from a linear regression model, and Fig. 2 shows the probability of reporting the highest level of life satisfaction (i.e., satisfied "a lot"). Although confidence intervals in analyses of "multiply-imputed" data can be slightly biased (Klein, 2014), the results are very similar to those from analyses without imputation, shown in Online Appendix A (see Figs. 3 and 4). As with previous analyses, as a further robustness check models are also estimated with wave three data, and graphs of those estimates are presented in Online Appendix B.

The figures show that both level of life dissatisfaction and likelihood of reporting "a lot" of life satisfaction are much more strongly associated with income among men than women. Yet income inequality scores differ very little by "race" (i.e., skin color), and the slopes for income effects are very similar for men in the two racial categories and women in the two racial categories. It could be that interaction between inequality and relative income simply provided a serendipitous route to the discovery of gender and race differences. However, analyses of data from the third wave suggest that income ineqaulity levels might play a role. As noted previously, at the third wave intersectional inequality scores are much higher among non-white than white women. The wave-three analyses indicate that the marginal effect of relative income on the probability of reporting high satisfaction among non-whites is negative, suggesting that there is a tendency for increasing income to be associated with increasing denial of the highest level of life satisfaction among non-white women. In contrast, the association of income with the highest level of life satisfaction is essentially zero among white women (as in Fig. 2), suggesting that income, on average, has no direct effect on that dimension of wellbeing.

Although the negative marginal association of relative income with high level satisfaction among women suggested by the graphs is unexpected, it is important to note that the

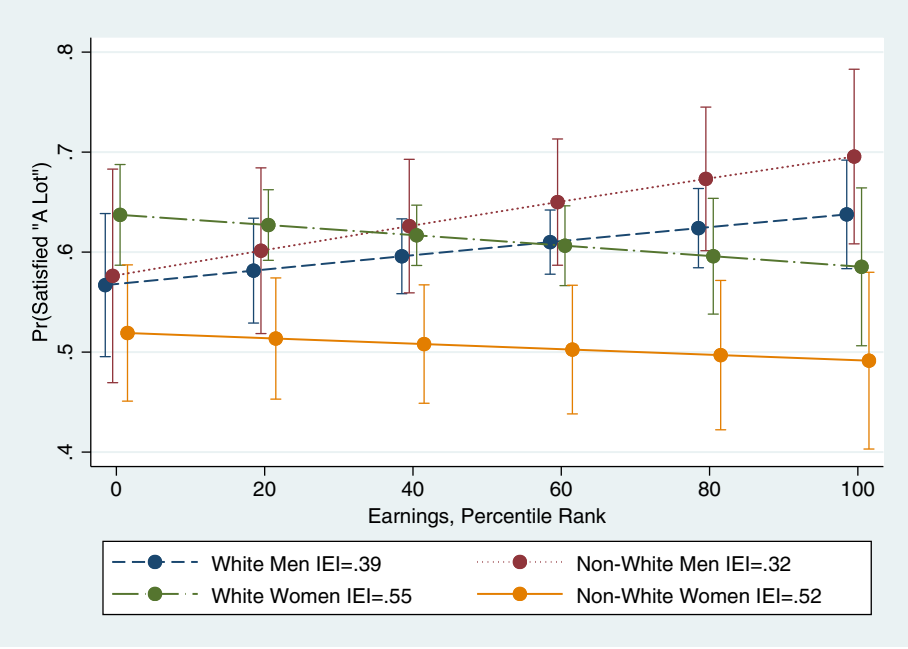

Fig. 2 Association of earnings rank with probability of being satisfied "a lot" with life

predicted trend is derived from marginal effects estimated in models that include covariates. The zero-order association between relative income and life dissatisfaction among women as calculated in the imputed analysis is essentially nil ($r = 0.01$, $p > 0.10$). Yet the probability of high life satisfaction rises with income for white men, and the logistic regression results graphed in Fig. 2 indicate that at the highest income (i.e., from about the 60th income percentile on) white men are significantly more likely to report being satisfied "a lot" with their life than are non-white women.

5 Discussion

5.1 IEI as a Moderator of the Association of Earned-Income with Life Satisfaction

The association of income with life satisfaction is stronger among men than women, and within-group income inequality is lower among men than it is among women. This pattern of results is consistent with the income rank hypothesis (Quispe-Torreblanca et al., 2021). The results for race are not consistent with that hypothesis, but the race difference in income inequality might be too small for income rank-related processes to occur. In analyses of wave-three data (presented in Online Appendix B), the difference in inequality between white and non-white women is larger, as are effects of income. However, there are too few high-income non-white women in that wave to rely on the wave-three results.

Even if the results are interpreted as indicating solely a gender difference in income effects, rather than a joint race-gender (i.e., intersectional) difference, the observation of a

gender difference alone in the effect of income on life satisfaction is important. Moreover, the way the difference was revealed, through a procedure in which intersectional groups are ranked in terms of their level of inequality, has potentially important implications for future research. The results suggest that it might be profitable for future studies to order a larger number of intersectional groups by level of within-group inequality. Since the stability of inequality scores depends on the size of the groups (Breunig & Hutchinson, 2008), analyses of inequality within more groups would require large samples.

Even though the results do not indicate an overall race difference in income effects, non-white women with relatively high incomes are found to be less likely than high-income white men to report the highest level of life satisfaction. The results from the partial proportional odds analyses suggest that there may also be differences in income effects on reporting low satisfaction (i.e., high dissatisfaction). However, there are too few cases reporting the lowest levels of satisfaction to isolate that result.

Focusing on the findings with respect to reporting high life satisfaction, it could be that opportunities and experiences of discrimination that women experience both in workplaces and the labour market, such as gender discrimination, manifest in "glass ceilings" (Wright et al., 1995), interfere with the attainment of high life satisfaction among relatively high-earning non-white women. Glass ceilings that prevent women from attaining the same level of status and power as men, even when income is equivalent, could undermine the life satisfaction of high earning women.[4]

Although many social and psychological processes could contribute to the gender differences in estimated income effects on life satisfaction (Suh et al., 1998), ideas about social comparisons motivate most research in this area (Liao, 2021; Quispe-Torreblanca et al, 2021). Thus, the potential role of social comparisons in the gender-differentiated effect of income on satisfaction deserves further consideration. One reason why even high earning women do not more often report they are satisfied "a lot" than women who earn less could be that the comparisons they make suggest they are not receiving remuneration comparable to men (England, 2017). In other words, between-group comparisons to men, rather than within group comparisons to other women, might underlie the results for relatively high earning women (Diener et al., 2018: 19; Sousa-Poza & Sousa-Poza, 2000). However, a study that analyzed data from the German Socio-Economic Panel study (Ravazzini & Piekałkiewicz, 2019), in which respondents were directly asked the importance of comparing one's earned income to "(other) women" and "(other) men," found that comparisons to other women were considered more important to women than are comparisons to men. Among men there was no difference in the reported importance of comparisons to women versus other men. The average income of the reference group, though, was found to have a significant effect on life satisfaction only among men in that study. The relevance of those findings for the results presented here are ambiguous because research suggests that gender differences in satisfaction differ with the nationality of samples (Diener et al., 2018: 19; Sousa-Poza & Sousa-Poza, 2000).

National differences could reflect differences in the way earnings expectations are gendered. For example, the stronger effect of earned income on life satisfaction among men than women might reflect fulfillment of a traditionally gendered bread-winner role (Zuo & Tang, 2000). Another potentially relevant cultural factor is the standard for deservingness.

[4] Recall that the coding of income is capped at $250,000 (1995 dollars) in these analyses due to sparseness of data above that level. Thus, gender and race differences at higher income levels are not detected in these analyses.

Deservingness contributes to both perceptions of justice and level of wellbeing (Harding et al., 2020; Lucas et al., 2012; Michalos, 1985). Income effects may be stronger among men than women if relatively low-income men perceive their relative disadvantage is more unjust than low-income women perceive their disadvantage to be, and/or if high-income men are more likely to feel their compensation is justified than do high-income women. The results graphed in Fig. 2 are broadly consistent with that possibility.

5.2 Comparing the Results for DIOLA and Life Dissatisfaction, and Considering Other Results of DIOLA Analyses

Although the association of income with life satisfaction varies with within-group inequality, the association of income with DIOLA does not. One potential explanation for why intersectional inequality moderates the effect of income on (dis)satisfaction, but not DIOLA, is that current intersectional inequality directly influences how the social comparisons that are relevant to satisfaction are perceived or framed, but not how the comparisons relevant to DIOLA are perceived or framed. Recall that according to multiple discrepancies theory (Michalos, 1985), comparisons that influence life satisfaction include comparisons to others (i.e., other's income), as well as comparisons to aspirations. In contrast, only comparison of current income to the income one had previously aspired to earn are relevant to DIOLA. In other words, the comparisons relevant to DIOLA are closely associated with a certain kind of self-comparison rooted in the past (i.e., comparison to a previously desired possible self, where self is defined in terms of earnings), rather than contemporaneous comparisons to others (i.e., social comparisons). Current income inequality is directly relevant to contemporaneous comparisons to others, and it might be that only those comparisons powerfully influence the effect of income on life satisfaction. As noted above, current inequality is only indirectly relevant to aspirations through an association of current inequality with prior inequality, as well as through the effect of prior income inequality on the formation of aspirations. Complex processes, such as those associated with internalized oppression and self-blame (Mackenzie, 2014), could weaken any effect of prior inequality on aspirations, and thereby weaken or eliminate current inequality as a moderator of the effect of income on DIOLA.

Other differences in associations of DIOLA versus life (dis)satisfaction that emerge from the analyses are in effects of control variables. Those differences are potentially important because they suggest fundamental differences in the processes that underlie satisfaction and disappointment. Thus, a brief discussion of post-hoc findings regarding those associations is warranted.

Only one variable is significantly associated with both mail and phone-assessed DIOLA but not life satisfaction—the interaction of gender with education. As noted above, a graph of that interaction, presented in Online Appendix D, indicates that the negative association of education with DIOLA is stronger for women than men. This suggests that educational aspirations and accomplishments might be more salient in evaluations of overall life accomplishment for women than men in this sample. Given the surprisingly low correlation between DIOLA assessed by mail and phone, the consistency of this association across analyses of the two measures is impressive. Future studies that seek to differentiate the evaluative processes associated with (ds)satisfaction versus DIOLA might therefore find it useful to focus on gender differences in the salience of educational accomplishments, or whether there are gender differences in the way educational achievements are evaluated, or influence disappointment.

In addition to the focal interaction between income and intersectional inequality, two variables are significantly associated with life satisfaction but are not significantly associated with either measure of DIOLA. One of those variables is the interaction between gender and age. That interaction indicates that the tendency for MIDUS respondents to increasingly endorse the highest level of life satisfaction with age is more pronounced for men than women. In contrast, age does not have a gender-differentiated effect on DIOLA. This suggests that the life course processes underlying disappointment and satisfaction might be fundamentally different. The other variable significantly associated with life satisfaction in the wave one analysis, but not DIOLA, is the contrast between the never married and the currently married. However, that contrast is significant in the analysis of both DIOLA and life dissatisfaction assessed at wave three. This suggests that disappointment related to never having been married might only arise years after the association of never married status with overall life dissatisfaction is observable.

5.3 Limitations and Future Directions

This study is unique in focusing on inequality within demographically defined intersectional contexts as a potential moderator of the effect of income on wellbeing. A limitation is that intersectional inequality was not investigated in the context of different levels of geographic inequality. Previous studies have investigated the direct effects of geographic inequality (Ngamaba et al., 2018; Schneider, 2019), and how absolute and relative income effects vary with geographic inequality (Macchia et al., 2020; Quispe-Torreblanca et al., 2021). Liao's (2021) study illustrates how income inequality effects can be studied at multiple levels (i.e., within intersectional group and geographically). Future studies might attempt to separate out effects of geographic and non-geographic forms of income inequality as moderators of income effects.

Future research might also incorporate additional forms of inequality. For example, it might be profitable if studies consider how inequalities within households (Kollamparambil, 2021) and families (Cichy et al., 2013; Culatta & Clay-Warner, 2021) are embedded in broader geographic and intersectional inequalities. Bringing in family inequality would also help integrate the literature on intergenerational mobility and wellbeing (Dobewall et al., 2019) with literatures on inequality, personal resources, and wellbeing.

It would also be useful for future studies to directly assess comparative processes. Although those processes are theoretically central, neither the current study nor previous research on relative income and income inequality (Liao, 2021; Macchia et al., 2020; Quispe-Torreblanca et al., 2021) have directly assessed comparative processes. It might be particularly useful if future studies that investigate social comparison processes consider the role of social media. Social comparisons to abstractly similar others might be facilitated by social media, since social media has increasingly provided an opportunity for more generalized and geographically diffused social comparisons (Olivos et al., 2020). There is a tendency for networks to remain homophilous (Kalmijn & Vermunt, 2007; Thomas, 2019), even though social media provides the opportunity to engage with others from different backgrounds and characteristics. A tendency towards homophily could result in persistent demographic similarities among those with whom one interacts, and with whom one compares oneself. This could in turn result in stronger effects of intersectional inequality in future studies than observed in the current study, which was based on data that was collected before social media was available.

In addition to technological and social changes, cultural and psychological changes might be considered as relevant to income and income inequality effects in future studies by focusing on materialistic values and meritocratic beliefs (Hoyer, 2020; Wilkinson & Pickett, 2019). Values and beliefs related to income, and the goods that money provides access to, might be investigated as mediators of the moderating effects of income inequality on wellbeing. Other relevant mediators and moderators include norms, expectations, perceptions of justice, and income-related practices. Income-related practices include consumerist practices. For example, there is evidence that the propensity to purchase luxuries to signal one's status (i.e., display consumption) is greater in lower inequality than higher inequality settings (Dubois, 2020: p 80). Studies of the association of these practices with demographic characteristics and demographically defined inequalities might help expand upon the results reported here.

Like previous research on the association of income and inequality with subjective wellbeing (Liao, 2021; Macchia et al., 2020; Quispe-Torreblanca et al., 2021), the current study is based on cross-sectional data. Cross-sectional analyses provide limited bases for inference about causality. Cross-sectional analyses were conducted because the number of cases within more complex intersectional groups was too small to permit stable estimates of intersectional inequality at later waves of the study. However, procedures to adjust for small sample bias have been proposed (De Nicolò, Ferrante & Pacei, 2021). Implementation of those procedures could potentially permit analyses that allow for investigation of more complex forms of intersectional inequality, and the unique experiences and wellbeing profiles of those in marginalized intersectional locations (Crenshaw, 2017; Degnen & Tyler, 2017).

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10902-022-00599-y.

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