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Research paper

The reciprocal relationships between economic status and mental health: Investigating the between-person and within-person effects in a three-wave longitudinal study

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ABSTRACT

Background: Social drift/selection (i.e., mental health symptoms cause low economic status) and social causation theories (i.e., low economic status causes mental health symptoms) specify reciprocal relationships between economic status and mental health. Little is known regarding the disaggregation of within-person and between-person effects in the relationship between economic status and mental health in the long run. The current study sought to examine the reciprocal relationships between economic status and mental health over 20 years of adulthood, disaggregating within-person and between-person effects.

Methods: Data were from three waves (7108 participants) of the Midlife Development in the United States study. Participants reported information about objective and subjective measures of economic status as well as a wide range of indicators of mental health on the positive dimension, including subjective, social, and psychological well-being, and on the negative side, depression, anxiety, panic attack, anhedonia, somatic amplification, alcohol abuse, and negative affect. Cross-lagged panel models were estimated.

Results: At between-person levels, both social drift/selection and social causation hypotheses were confirmed when considering subjective measures of economic status. When using objective measures of economic status (i.e., income), the results showed decreased support for social drift/selection and social causation hypotheses. At within-person levels, social drift/selection and social causation hypotheses were generally not supported, with some notable exceptions.

Limitations: Restriction of the sample to one country limits the generalizability of the findings.

Conclusions: Social causation and social drift/selection processes act simultaneously mainly at a population level, but much less when considering individual changes. Policy and programs should be targeted at addressing inequality in income and mental health within a nation or a community.

1. Introduction

There is abundant evidence that objective and subjective indicators of economic status are associated with mental health (e.g., Frankham et al., 2020; Thomson et al., 2022). However, it has been difficult to draw conclusions about the directionality of the relationship between economic status and mental health. In their systematic review and meta-analysis, Thomson et al. (2022) concluded that income changes probably have an impact on mental health; however, heterogeneity was high and certainty of the evidence was low or very low. It should be noted that there is less evidence that mental health has an impact on socio-economic attainment (Mossakowski, 2014).

1.1. Theoretical framework for the association between economic status and mental health

The theoretical framework for the association between economic status and mental health is based on the social causation theory and the social drift (sometimes referred to as social selection) theory. Social causation theory predicts that adverse socioeconomic conditions (such as low income and financial stress) increase the likelihood of mental health problems, due to stressful experiences (e.g., living in dangerous neighborhoods) and deterioration of psychosocial resources. Conversely, the social drift (or social selection) theory posits that mental health problems drift people into poverty, due to unemployment (e.g.,

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experiences of failure in finding a job and job loss), stigma, health expenditure, disability, and social support deterioration (e.g., Eaton et al., 2009; Mossakowski, 2014; Muntaner et al., 2013). While social causation theory refers to the idea that the life events and experiences of people are different according to their economic status and this can influence their likelihood of experiencing poor mental health problems, social drift/selection theory gives causal priority to genetic inheritance and predisposition to mental illness. These two influences are not mutually exclusive. Instead, they can operate in parallel or jointly and their importance may depend on the mental health outcomes under investigation (Eaton et al., 2009; Muntaner et al., 2013). Therefore, it is important to investigate the effects of social selection/drift and social causation processes using different indicators of mental health.

1.2. The investigation of the bi-directional relationship between economic status and mental health

A systematic review investigating the relative importance of social drift/selection and social causation theories and focusing on health in general (mostly physical health) revealed empirical support for both theories (Kröger et al., 2015). However, the evidence does not support a preference for one theory over the other and there are also discrepancies among studies. In addition, the current evidence regarding the simultaneous and reciprocal relationships between economic status and mental health is inconclusive and warrants further research.(e.g., Eaton et al., 2009; Mossakowski, 2014; Muntaner et al., 2013). One potential explanation for the inconsistency is the difference in the methodology used. The most common approach used to test social drift/selection and social causation theories was the cross-sectional design (Muntaner et al., 2013). Longitudinal studies are better suited to study causal processes that unfold over time. There is evidence from recent longitudinal studies that social causation and social drift/selection operate simultaneously in the short term (Cao et al., 2021; Jin et al., 2020; Lund and Cois, 2018). However, given the short time span between data rounds (two to four years), the question of the long-term effects remains still open. Longer-term longitudinal designs provided evidence of stable patterns of mental health trajectories both under normal life circumstances (e.g., Cullati et al., 2014; George, 2013) and after exposure to potentially traumatic events (i.e., resilience trajectory; Galatzer-Levy et al., 2018). Therefore, it is possible to assume that economic status and mental health trajectories are only sensitive to situational influences in the short-term and are mostly stable in the long-term.

Another important point is that the answers to the questions relating to social drift/selection and social causation theories require the use of long-term longitudinal studies that not only model both directions of causality but also take into account both within-person and between-person levels (Su et al., 2021). Indeed, the conceptual meaning of the cross-lagged coefficients in testing the prospective effects in longitudinal research differs across cross-lagged models (Curran and Bauer, 2010). Longitudinal models allow for the examination of different hypothesized causal effects. The investigation of interindividual (between-person) effects is about the change in the dependent variable among individuals who have previous low or high values (relative to others) of the independent variable. According to social drift/selection theory, the hypothesized causal effect is, "When people experience high mental health problems compared to other people, they will report a subsequent decrease in their economic status." Based on social causation theory, the hypothesized causal effect is, "When people report a low economic status compared to other people, they will experience a subsequent deterioration in their mental health." In contrast, the investigation of intraindividual (within-person) prospective effects concerns within-person change in the dependent variable as a function of previous within-person deviation from a person's trait level in the independent variable. Therefore, based on social drift/selection theory, the hypothesized causal effect is, "When people experience higher mental health problems than usual, they will report a subsequent decrease in their economic status." According to social causation theory, the hypothesized causal effect is, "When people report a lower economic status than usual, they will experience a subsequent deterioration in their mental health."

In sum, social drift/selection and social causation theories posit complex reciprocal relations between economic status and mental health at both between-person and within-person levels of influence. Following an approach that distinguishes within-person prospective effects and between-person prospective effects, Su et al. (2021) demonstrated that higher household income predicted higher self-perceived mental health (but not vice versa) at the between-person levels. At within-person levels, no prospective effects were found, neither from self-perceived mental health income on household income nor from household income on self-perceived mental health. Therefore, it is important to test the assumptions of social drift/selection and social causation theories, distinguishing between-person and within-person levels of influence.

1.3. The present study

The main aim of the present study was to investigate the reciprocal longitudinal relations between economic status and mental health at both the between-person and within-person levels. Previous research (e.g., Euteneuer et al., 2021; Nobles et al., 2013) focused on the relationship between socioeconomic status and self-rated health or health-related quality of life. However, mental health, self-rated health, and health-related quality of life are different health domains. Results from one domain cannot be uncritically applied to other domains. Moreover, previous research (e.g., Euteneuer et al., 2021; Nobles et al., 2013) did not disaggregate the between-person and within-person levels of effect in longitudinal models. The conflation of within-person and between-person effects might result in biased cross-lagged estimates (Hamaker et al., 2015). Furthermore, the investigation of both between-person effects and within-person effects is of interest because each has its unique implications for theory and practice (Curran and Bauer, 2010). From a theoretical perspective, it is important to clarify whether social drift (or social selection) and social causation theories explain intra-individual processes (i.e., what will happen to a given person) or interindividual processes (i.e., what will happen across a set of people). From a practical standpoint, between-person and within-person processes point to different interventions (e.g., interventions targeted at reducing disparities vs. negative changes at the intraindividual level). The present research also extends the study conducted by Su et al. (2021) by including a wide range of indicators of mental health and economic status. For instance, Su et al. (2021) used a one-item self-report measure of self-perceived mental health, which cannot be comprehensive and encompass the diverse and complex aspects of mental health. According to Thomson et al. (2022), there is a need for longitudinal studies including multidimensional measures of mental health and income on a continuous scale. In addition, different from previous works (e.g., Jin et al., 2020; Lund and Cois, 2018) that considered longitudinal relationships in the short-term, the present study aimed at investigating the relationship over a 20-year period.

An additional aim of the current study was to investigate the role of objective and subjective indicators of economic status. There is evidence that subjective and objective measures of economic status are distinct and the associations between economic status and well-being differ by whether economic status is evaluated subjectively or objectively (Tan et al., 2020). To the best of my knowledge, no evidence to date exists to compare the relative importance of objective income levels and subjective perceptions of economic status in their relationships across different indicators of mental health in the long term.

Finally, previous research did not examine the strength of the bidirectional relationships between economic status and mental health. A further aim of this paper is to quantify the effect size of these bidirectional relationships.

1.4. Theoretical framework and hypotheses

The hypotheses of the current study were grounded on two theoretical approaches. According to the social causation theory, lower levels of socioeconomic conditions would predict lower levels of mental health (Hypothesis 1). According to the social drift (or social selection) theory, lower levels of mental health would predict lower levels of socioeconomic conditions (Hypothesis 2).

2. Method

2.1. Design and sample

Data from the Midlife in the United States (MIDUS) study were used for this research. The MIDUS study began in 1995–1996 (MIDUS 1 or M1) with a baseline sample of 7108 participants. The second and third follow-up surveys were carried out in 2004–2006 (MIDUS 2 or M2) and 2013–2014 (MIDUS 3 or M3) and were completed by 4963 and 3294 longitudinal participants, respectively. Self-reported measures were collected via phone interviews and self-administered questionnaires. MIDUS 1 participants were from a nationally representative sample of United States non-institutionalized English-speaking adults, aged 25–74. Data were from waves 1 (1995–1996; Brim et al., 2020), 2 (2004–2006; Ryff et al., 2021), and 3 (2013–2014; Ryff et al., 2019). All available cases were included in the analysis. Table 1 shows the sample characteristics at baseline. Drop-out analysis (Table S1) revealed that there were no meaningful differences in study variables. Specifically, although the differences between groups were statistically significant, they were small in effect size according to the criteria proposed by (Cohen, 1988). More information about the MIDUS methodology can be found elsewhere (Brim et al., 2004). Fig. 1 displays the flowchart of participants in the MIDUS Study.

2.2. Instrument

Household income was measured by calculating household total income from wage, pension, social security, and other sources. The logarithm of income was used because the relationship between income and well-being is assumed to be curvilinear, with decreasing marginal returns at the higher income ranges (e.g., Kahneman and Deaton, 2010; Thomson et al., 2022). The logarithm of income was adjusted for the size of the household using the square root scale (Atkinson et al., 1995).

Two items were used to measure subjective economic status. The first item refers to the assessment of the current financial situation ("Using a scale from 0 to 10 where 0 means 'the worst possible financial situation' and 10 means 'the best possible financial situation,' how would you rate your financial situation these days?"). The second item refers to the perceived ability to pay monthly bills ("How difficult is it for you (and your family) to pay your monthly bills?"). Response options to this question were very difficult (1), somewhat difficult (2), not very difficult (3), and not at all difficult (4).

Table 1
Sociodemographic Data of the Wave 1 Interviewees.

	n	%	*M*(*SD*)
Age			46.38(12.99)
Gender (female)	3666	51.6 %	
Income			73,382.71 (64,885.483)
Education			
Some grade school to some high school	681	9.6	
General Educational Diploma to graduated high school	2059	29.0	
Some college (no bachelor's degree)	2173	30.6	
Graduated college to doctorate or professional degree	2181	30.7	
Ethnicity			
White	5599	90.7	
Black and/or African American	321	5.2	
Native American or Aleutian Islander/ Eskimo	37	0.6	
Asian or Pacific Islander	57	0.9	
Other	119	1.9	
Multiracial	42	0.7	

Symptoms of depression, anhedonia, panic disorder, and generalized anxiety were assessed with the World Health Organization Composite International Diagnostic Interview short-form (CIDI-SF; Kessler et al., 1998). The CIDI-SF exhibited good psychometric properties in terms of validity (Kessler et al., 1998). Higher scores indicate more symptoms of depression, anhedonia, panic disorder, and generalized anxiety. Scores were used instead of latent variables because the scores were calculated using a set of rules and filter questions.

The five-item somatic amplification scale (Barsky et al., 1988) was used to assess somatosensory amplification (the tendency to experience somatic sensations as disturbing, noxious, and intense). Each item was answered on a four-point scale ranging from 1 (*Not at all true*) to 4 (*Extremely true*). Higher scores indicate greater levels of somatosensory amplification.

Alcohol abuse was measured using a four-item modified version of the Michigan Alcoholism Screening Test (MAST), which showed adequate reliability and validity for most research purposes (Shields et al., 2007). The response option for each question was *Yes* or *No*. The four MAST items were summed to a total score, with low values reflecting no alcohol abuse.

Mental health was self-evaluated using the following question: "What about your mental or emotional health? (Would you say your mental or emotional health is excellent, very good, good, fair, or poor?)." Responses to this item ranged from 1 (*excellent*) to 5 (*poor*) and were reverse-coded, so a higher score indicated better perceived mental health.

Positive and negative affect were assessed using two established scales comprising six items each (Mroczek and Kolarz, 1998). A 30-day response frame was used, and participants were asked to rate how much of the time they felt each subjective state on a five-point scale ranging from 1 (*All of the time*) to 5 (*None of the time*). The responses were reverse-coded, so that higher scores reflect higher levels of negative/positive affect.

A five-item scale of life satisfaction (Prenda and Lachman, 2001) was used. For each item, participants were asked to rate their life overall, health, work, relationship with spouse/partner, and relationship with children. Each item was coded from 0 (*the worst possible*) to 10 (*the best possible*). An overall mean score was calculated, with higher scores reflecting higher levels of overall life satisfaction.

A scale of psychological well-being (PWB; Ryff and Keyes, 1995) that comprises six dimensions of wellness (i.e., autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance) was used. Each dimension of wellness was measured using three items. The response scale was a 7-point continuum, ranging from 1 (*Strongly agree*) to 7 (*Strongly disagree*). The six dimensions of wellness can be considered to form a unidimensional latent variable. High scores on this latent variable reflect higher PWB.

The social well-being scale (SWB; Keyes, 1998) was used. This scale includes five dimensions of social well-being (i.e., social integration, social contribution, meaningfulness of society, social actualization, and social acceptance). Except for meaningfulness of society which comprises two items, each dimension consists of three items. Response options ranged from 1 (*Strongly agree*) to 7 (Strongly disagree). The five dimensions of social well-being can be thought to represent a unidimensional latent variable. High scores on this latent variable represent higher SWB.

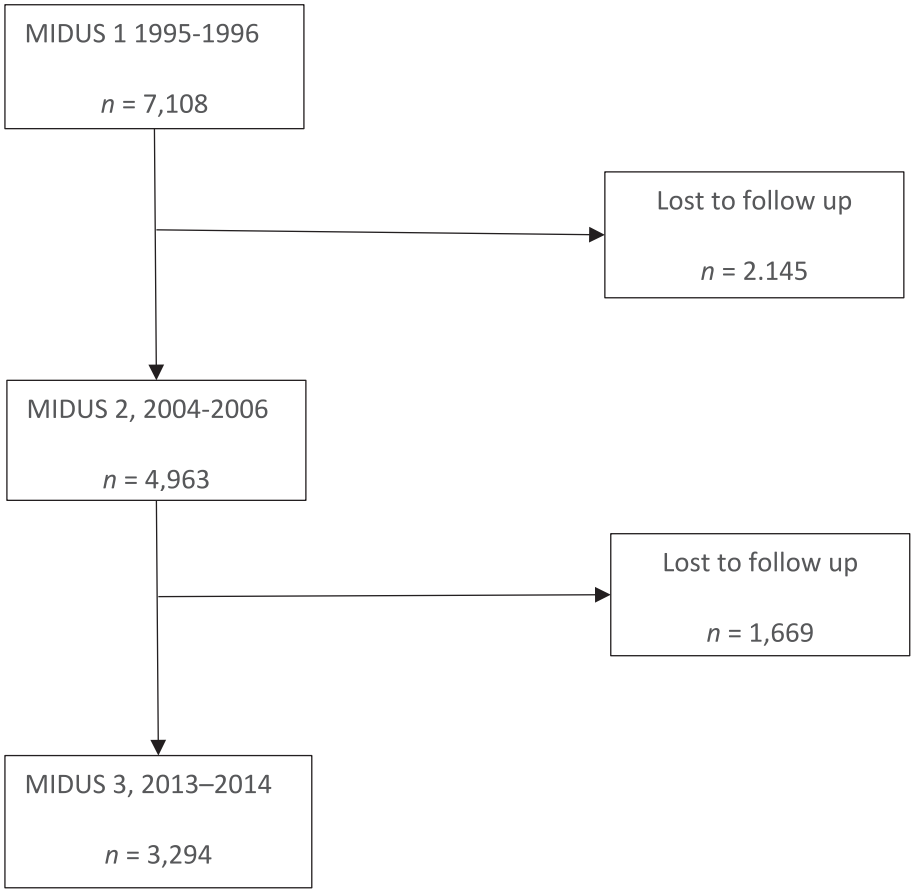

Fig. 1. Flowchart of Participants in MIDUS Study.

2.3. Analytic strategy

A series of cross-lagged panel models (CLPM) and random intercept cross-lagged panel models (RI-CLPM) were used to estimate the between-person and within-person associations, respectively. The residual structural equation model (RSEM) framework was used to estimate the RI-CLPM model (Asparouhov and Muthén, 2023c). Cross-wave equality constraints on (unstandardized) cross-lagged effects were used. When testing the cross-lagged panel models, latent variables were fitted using a two-stage approach (Lai and Hsiao, 2022). Analyses were conducted using Mplus and Bayesian estimation with diffuse priors. When the measures of mental health symptoms were heavily right-skewed with many participants reporting no or few symptoms, these variables were treated as ordinal. When handling categorical variables, a weighted least squares and maximum likelihood estimator was chosen. Missing data were handled using a full information method (Bayesian estimator) or multiple imputations ($n = 10$; weighted least squares and maximum likelihood estimator). Both maximum likelihood estimation and multiple imputations use full information from incomplete and complete cases, thereby including respondents with missing times of measurement or missing responses. To control for potential Type I errors due to multiple testing, the Benjamini-Hochberg procedure (Benjamini and Hochberg, 1995) with a conservative false discovery rate of 0.05 was used. To interpret the size of cross-lagged effects, Orth et al. (2022) recommend that researchers use the following benchmark values: 0.03 (small effect), 0.07 (medium effect), and 0.12 (large effect), for both the CLPM and RI-CLPM. Although the inclusion of statistical control variables is routine and widespread, conclusions based on the blind or automatic inclusion of control variables are likely to be incorrect (Spector and Brannick, 2016).To avoid a blind inclusion of control variables, no covariates were included in the analysis.[1]

The CLPM relies on the assumption of no unmeasured confounding. According to Lüdtke and Robitzsch (2022), the inclusion of higher-order lags (i.e., lag-2 effects or the effects of variables across two units of time) in addition to lag-1 effects in the CLPM is a more comprehensive control for the presence of confounding (see also VanderWeele et al., 2020).

3. Results

Fit indices for models were reported in Tables S2-S4. Fit indices demonstrated a good fit to the data and did not indicate misspecification problems.

3.1. Longitudinal invariance of the latent variables

Preliminary analyses were conducted to test all latent variables for measurement longitudinal invariance. Invariance across time was tested using the longitudinal alignment method (Asparouhov and Muthén, 2023a; Asparouhov and Muthén, 2023b). To assess the performance of the longitudinal alignment method, the common rule of thumb in which no >25 % of parameters are deemed noninvariant to conclude good performance (Luong and Flake, 2023) was used. Analyses revealed that the number of non-invariant parameters did not exceed the 25 % rule of thumb. Specifically, the percentages of non-invariant parameters for

[1] These sentences were added in response to an anonymous reviewer's comment: "Typically, covariates should be included in analyses."

psychological well-being, social well-being, life satisfaction, somatic amplification, alcohol abuse, and positive and negative affect were, respectively, 19 %, 13 %, 10 %, 7 %, 0 %, 8 %, and 8 %.

3.2. Household income

The reciprocal effects between household income and mental health are presented in Table 2. The findings indicate that most of the between-person reciprocal relationships between household income and mental health symptoms were non-significant. Anxiety predicted household income, while household income predicted negative affect. However, the predictive effect of anxiety on household income was non-significant after performing the Benjamini–Hochberg procedure. Most of the between-person reciprocal relationships between household income and positive mental health were significant. The effect sizes were on average small. In addition, with a few exceptions, the findings do not support the within-person reciprocal effects between household income and mental health. The exceptions were the significant cross-lagged effects of household income on life satisfaction and psychological well-being. However, the effect of household income on life satisfaction was non-significant after performing the Benjamini–Hochberg procedure.

3.3. Current financial situation

Table 3 displays the reciprocal effects between participants' ratings of their current financial situation and mental health. The findings indicate that most of the between-person reciprocal relationships between the current financial situation and mental health were significant. The effect sizes were on average small. Anhedonia and alcohol abuse did not predict the perceived current financial situation. In addition, with a few exceptions, the findings do not support the within-person reciprocal effects between the perceived current financial situation and mental health. The exceptions were the significant reciprocal effects between the current financial situation and three indicators of mental health: Anhedonia, social well-being, and alcohol abuse. However, the effect of anhedonia on the current financial situation was non-significant after performing the Benjamini–Hochberg procedure. Another exception was the significant effect of life satisfaction on the perceived current financial situation.

3.4. Perceived ability to pay monthly bills

The reciprocal effects between the perceived ability to pay monthly bills and mental health are presented in Table 4. The results reveal that most of the between-person reciprocal relationships between the perceived ability to pay monthly bills and mental health were significant. The perceived ability to pay monthly bills did not predict alcohol abuse. Alcohol abuse and anhedonia did not predict the perceived ability to pay monthly bills. On average, the effect sizes were small. Moreover, with a few exceptions, the within-person reciprocal effects between the perceived ability to pay monthly bills and mental health were non-significant. The exceptions were the significant cross-lagged effects of the perceived ability to pay monthly bills on (both social and psychological) well-being and life satisfaction and the cross-lagged effects of negative affect, life satisfaction, and social well-being on the perceived ability to pay monthly bills.

4. Discussion

The cross-lagged parameters that characterize within-person processes revealed that changes in income levels and mental health within individuals over time are not interrelated. There is one exception to this overall pattern. A within-person increase in income levels predicted an increase in psychological well-being. If we look at subjective indicators of economic status, there is somewhat more support for social drift/selection and social causation theories in terms of within-person processes. In particular, the findings revealed significant reciprocal relationships between subjective indicators of economic status and positive indicators of mental health, such as well-being and life satisfaction. In addition, there were significant reciprocal relationships between the perceived current financial situation and anhedonia. These findings suggest that the stress associated with perceived economic difficulties may deleteriously impact motivation or capacity to experience pleasure or enjoyment and, at the same time, this negative experience may have a negative impact on subsequent perceived economic status. This interesting reciprocal relationship has not been reported previously. Despite this, there is some evidence supporting the idea that anhedonia has an economic impact (Cohen et al., 2020) and that worries about economic matters increase the risk of anhedonia (Tanimukai et al., 2014).

In terms of within-person effects, the results provide scant support for both the social causation theory (Hypothesis 1) and the social drift (or social selection) theory (Hypothesis 2). In addition, it is interesting to note that weak or non-significant relationships were found between the subjective well-being indicators (i.e., positive affect and life satisfaction) and both objective and subjective indicators of economic status. This finding is surprising given the wealth of research on income and subjective well-being (e.g., Diener et al., 1999; Geerling and Diener, 2020; Kahneman and Deaton, 2010).

Concerning the between-person effects, the findings of the current study suggest different patterns of reciprocal relationships between objective economic status and mental health. The social causation theory (Hypothesis 1) was not supported when considering the effect of household income on negative indicators of mental health (except for negative affect). Moreover, social drift/selection theory (Hypothesis 2) received little support when testing the predictive role of negative indicators of mental health on household income. Specifically, only anxiety symptoms predicted later household income. Among the positive indicators of mental health, social drift/selection and social causation theories have been generally supported, especially when considering subjective indicators of economic status.

Social drift/selection (Hypothesis 2) and social causation (Hypothesis 1) theories received considerable support in the analyses of between-person prospective effects between both positive and negative indicators of mental health and subjective indicators of economic status. Moreover, self-perceived mental health predicted and was predicted by subjective indicators of economic status. The finding that higher household income predicts higher self-perceived mental health at between-person levels is in line with a previous study (Su et al., 2021).

It seems plausible to hypothesize that income may provide benefits in the short term (Jin et al., 2020; Lund and Cois, 2018) but not over the longer term. Therefore, if we look at the within-person effects over the longer term, findings are generally consistent with the predictions of both adaptation theory (Brickman and Campbell, 1971) and set-point theory (e.g., Lykken, 1999). However, the analysis of the between-person prospective effects revealed that the reciprocal relationships between mental health and subjective economic status are significant. For instance, these findings suggest that individuals with high subjective economic status have a higher probability of enhancing their mental health compared to individuals with low subjective economic status. Viewed from that perspective, the relationship between subjective economic status and well-being is the product of social comparison, in line with the assumptions of multiple discrepancy theory (Michalos, 1985). Future research should investigate the within-person relationship between economic status and mental health in the short term.

In terms of theoretical implications, the findings support the notion that social drift/selection and social causation theories should be refined to reflect the changes at the population level but not the individual changes. This notion is also supported by evidence from a previous study (Su et al., 2021). Moreover, when taking into account objective indicators of economic status, conventional assumptions of social drift/selection and social causation theories need to be reconsidered. The predictions from social drift/selection and social causation theories are

Table 2
Cross–Lagged Reciprocal Relationships Between Household Income and Mental Health.

	CLPM (between-person)			RI-CLPM (within-person)		
	β	*p*	95 % CI	β	*p*	95 % CI
Depression → Household income	0.00	0.929	−0.04, 0.04	0.02	0.691	−0.07, 0.12
Household income → Depression	−0.03	0.258	−0.07, 0.02	0.02	0.583	−0.06, 0.11
Anxiety → Household income	−0.03	0.031*	−0.07, −0.00	−0.14	0.220	−0.35, 0.08
Household income → Anxiety	−0.01	0.843	−0.12, 0.10	−0.08	0.308	−0.24, 0.08
Panic Attack → Household income	−0.02	0.324	−0.05, 0.02	0.01	0.803	−0.08, 0.11
Household income → Panic Attack	0.02	0.212	−0.01, 0.06	0.04	0.383	−0.05, 0.14
Anhedonia → Household income	0.01	0.435	−0.02, 0.05	0.04	0.580	−0.10, 0.18
Household income → Anhedonia	−0.04	0.243	−0.09, 0.02	−0.04	0.599	−0.19, 0.11
Somatic Amplification → Household income	−0.01	0.526	−0.04, 0.02	0.02	0.530	−0.04, 0.07
Household income → Somatic Amplification	−0.02	0.064	−0.05, 0.00	−0.01	0.856	−0.05, 0.05
Alcohol abuse → Household income	−0.01	0.472	−0.04, 0.02	−0.05	0.066	−0.09, 0.00
Household income → Alcohol abuse	−0.01	0.536	−0.05, 0.02	−0.06	0.132	−0.13, 0.02
Mental health self-evaluated → Household income	0.03	0.180	−0.01, 0.07	−0.03	0.124	−0.08, 0.01
Household income → Mental health self-evaluated	0.02	0.064	0.00, 0.05	0.00	0.914	−0.05, 0.05
Negative Affect → Household income	−0.01	0.516	0.02, −0.04	−0.02	0.410	0.08, −0.03
Household income → Negative Affect	−0.04	0.002	−0.02, −0.06	−0.03	0.276	0.02, −0.08
Positive Affect → Household income	−0.01	0.396	0.02, −0.04	0.01	0.772	0.06, −0.04
Household income → Positive Affect	0.03	0.036*	0.05, 0.00	0.05	0.054	0.10, −0.00
Life Satisfaction → Household income	−0.04	0.006	−0.06, −0.01	−0.02	0.448	−0.07, 0.03
Household income → Life Satisfaction	0.03	0.020*	0.00, 0.05	0.06	0.024*	0.01, 0.10
Wel-being (PWB) → Household income	0.02	0.266	−0.01, 0.04	0.03	0.282	−0.02, 0.07
Household income → Well-being (PWB)	0.03	0.008	0.01, 0.05	0.06	0.014	0.01, 0.11
Social well-being → Household income	0.04	0.004	0.01, 0.06	−0.03	0.332	−0.08, 0.03
Household income → Social well-being	0.00	0.872	−0.02, 0.03	−0.04	0.092	−0.09, 0.01

Note. Standardized estimates are reported; CI = Confidence/Credible Interval.
* the effect was not significant when using the Benjamini-Hochberg procedure.

Table 3
Cross–Lagged Reciprocal Relationships Between the Current Financial Situation and Mental Health.

	CLPM (between-person)			RI-CLPM (within-person)		
	β	p	95 % CI	β	p	95 % CI
Depression → Subjective status	−0.06	<0.001	−0.08, −0.03	−0.05	0.319	−0.14, 0.05
Subjective status → Depression	−0.15	<0.001	−0.18, −0.12	−0.04	0.416	−0.13, 0.05
Anxiety → Subjective status	−0.05	<0.001	−0.08, −0.02	0.00	0.986	−0.20, 0.20
Subjective status → Anxiety	−0.22	<0.001	−0.28, −0.16	−0.06	0.562	−0.27, 0.14
Panic Attack → Subjective status	−0.04	<0.001	−0.06, −0.02	0.01	0.827	−0.07, 0.09
Subjective status → Panic Attack	−0.12	<0.001	−0.16, −0.09	−0.01	0.895	−0.09, 0.08
Anhedonia → Subjective status	−0.01	0.276	−0.04, 0.01	−0.18	0.027*	−0.35, −0.02
Subjective status → Anhedonia	−0.18	<0.001	−0.24, −0.12	−0.21	<0.001	−0.31, −0.11
Somatic Amplification → Subjective status	−0.05	<0.001	−0.07, −0.03	0.00	0.880	−0.06, 0.05
Subjective status → Somatic Amplification	−0.05	<0.001	−0.07, −0.03	−0.02	0.378	−0.07, 0.03
Alcohol abuse → Subjective status	−0.02	0.142	−0.04, 0.01	−0.09	<0.001	−0.14, −0.04
Subjective status → Alcohol abuse	0.03	0.034*	0.00, 0.06	−0.07	<0.001	−0.11, −0.03
Mental health self-evaluated → Subjective status	0.09	<0.001	0.06, 0.11	0.02	0.368	−0.03, 0.07
Subjective status → Mental health self-evaluated	0.10	<0.001	0.08, 0.12	0.03	0.210	−0.02, 0.08
Negative Affect → Subjective status	−0.20	<0.001	−0.14, −0.26	−0.03	0.278	0.02, −0.09
Subjective status → Negative Affect	−0.02	<0.001	−0.01, −0.03	0.00	0.990	0.05, −0.05
Positive Affect → Subjective status	0.08	<0.001	0.10, 0.05	0.03	0.246	0.09, −0.02
Subjective status → Positive Affect	0.06	<0.001	0.09, 0.04	0.02	0.460	0.07, −0.03
Life Satisfaction → Subjective status	0.08	<0.001	0.05, 0.10	0.05	0.092	−0.01, 0.10
Subjective status → Life Satisfaction	0.07	<0.001	0.05, 0.10	0.07	0.016	0.01, 0.12
Wel-being (PWB) → Subjective status	0.11	<0.001	0.08, 0.13	0.01	0.752	−0.04, 0.06
Subjective status → Well-being (PWB)	0.05	<0.001	0.03, 0.07	0.03	0.252	−0.02, 0.08
Social well-being → Subjective status	0.07	<0.001	0.05, 0.10	0.07	<0.001	0.05, 0.10
Subjective status → Social well-being	0.05	<0.001	0.03, 0.07	0.05	<0.001	0.03, 0.07

Note. Standardized estimates are reported; CI = Confidence/Credible Interval.
* the effect was not significant when using the Benjamini-Hochberg procedure.

shown to be more accurate when based on subjective indicators of economic status rather than objective indicators (i.e., household income). One implication of this study is that subjective economic status constitutes a psychological reality that is more intertwined with mental health than objective indicators such as income. It should be noted that predictions from both social drift/selection and social causation theories (regarding objective indicators of economic status) may be more accurate over a short time period (Jin et al., 2020; Lund and Cois, 2018). Finally, the strength (effect size) of the reciprocal relationships between mental health and economic status was generally small indicating that researchers and practitioners should have a more realistic understanding of the limited predictive utility of social drift/selection and social causation theories. Notwithstanding, small effect sizes at the individual level may represent meaningful effects at the population level. The modest effect sizes are in line with the findings of a previous meta-analysis reporting a modest impact of income changes on mental health (Thomson et al., 2022).

There has been a long-lasting debate concerning the use of the CLPM

Table 4
Cross–Lagged Reciprocal Relationships Between Perceived Ability to Pay Monthly Bills and Mental Health.*

	CLPM (between-person)			RI-CLPM (within-person)		
	β	p	95 % CI	β	p	95 % CI
Depression → Subjective status	−0.05	0.007	−0.08, −0.01	−0.01	0.763	−0.07, 0.05
Subjective status → Depression	−0.14	<0.001	−0.19, −0.10	−0.06	0.367	−0.19, 0.07
Anxiety → Subjective status	−0.03	0.003	−0.06, −0.01	0.11	0.082	−0.01, 0.23
Subjective status → Anxiety	−0.22	<0.001	−0.28, −0.16	−0.05	0.416	−0.16, 0.06
Panic Attack → Subjective status	−0.04	<0.001	−0.06, −0.02	0.02	0.604	−0.06, 0.11
Subjective status → Panic Attack	−0.12	<0.001	−0.17, −0.08	0.03	0.678	−0.09, 0.14
Anhedonia → Subjective status	−0.01	0.490	−0.03, 0.02	−0.12	0.131	−0.28, 0.04
Subjective status → Anhedonia	−0.14	<0.001	−0.21, −0.08	−0.11	0.079	−0.24, 0.01
Somatic Amplification → Subjective status	−0.05	<0.001	−0.07, −0.03	−0.02	0.396	−0.08, 0.03
Subjective status → Somatic Amplification	−0.04	<0.001	−0.06, −0.02	−0.02	0.494	−0.07, 0.03
Alcohol abuse → Subjective status	−0.01	0.322	−0.04, 0.01	−0.03	0.420	−0.08, 0.03
Subjective status → Alcohol abuse	0.01	0.686	−0.02, 0.03	−0.01	0.770	−0.07, 0.07
Mental health self-evaluated → Subjective status	0.07	<0.001	0.05, 0.09	0.01	0.838	−0.05, 0.05
Subjective status → Mental health self-evaluated	0.08	<0.001	0.06, 0.11	0.01	0.814	−0.04, 0.06
Negative Affect → Subjective status	−0.09	<0.001	−0.07, −0.12	−0.08	0.010	−0.02, −0.13
Subjective status → Negative Affect	−0.06	<0.001	−0.03, −0.08	−0.01	0.598	0.04, −0.07
Positive Affect → Subjective status	0.06	<0.001	0.08, 0.04	0.05	0.052	0.11, −0.00
Subjective status → Positive Affect	0.06	<0.001	0.08, 0.04	0.04	0.122	0.09, −0.01
Life Satisfaction → Subjective status	0.08	<0.001	0.05, 0.10	0.06	0.014	0.01, 0.11
Subjective status → Life Satisfaction	0.07	<0.001	0.05, 0.10	0.08	0.004	0.02, 0.13
Wel-being (PWB) → Subjective status	0.07	<0.001	0.05, 0.10	0.02	0.360	−0.03, 0.08
Subjective status → Well-being (PWB)	0.06	<0.001	0.04, 0.08	0.07	0.004	0.02, 0.13
Social well-being → Subjective status	0.07	<0.001	0.05, 0.10	0.05	<0.001	0.02, 0.07
Subjective status → Social well-being	0.05	<0.001	0.03, 0.07	0.05	<0.001	0.03, 0.07

Note. Standardized estimates are reported; CI = Confidence/Credible Interval.
* the effect was not significant when using the Benjamini-Hochberg procedure.

and the within-between distinction (e.g., Hamaker, 2023; Hamaker et al., 2015; Lucas, 2023). Even the critics of the CLPM (e.g., Hamaker, 2023; Hamaker et al., 2015; Lucas, 2023) agree that it may be appropriate for predictive purposes. Consequently, following this perspective, the between-person relationships described in the results section should be interpreted as being truly predictive.

5. Limitations

There are some limitations to the current study. First, subjective and objective indicators of economic status were assessed using single items, which cannot capture the complex nature of these constructs. Second, this research is also limited by the fact that findings relate to only one country, and this affects the generalizability of the research findings to other countries with different welfare systems, healthcare provisions, and cultures (e.g., low and middle-income countries). Third, the loss of respondents between waves can introduce bias. Fourth, many mental disorders (e.g., schizophrenia) were not included and the study of their reciprocal relationships with economic status is recommended for future studies. However, in the present study, a wide range of mental health indicators was used. Fourth, the analyses were conducted using models that were identified with three waves. Future research using intensive longitudinal design is critical to replicate the present findings. Fifth, another limitation concerns the possibility of both spurious cross-lagged effects and underestimation of real cross-lagged effects when using the CPLM (Lucas, 2023). Finally, while strong causal statements cannot be made, given the omitted variable problem, the concept of Granger causality can be used in the within-person effects of the present study (Hamaker et al., 2015).

6. Conclusion

The reciprocal relationships between economic status and mental health are complex and the fact that most cross-lagged coefficients (representing the association between economic status and mental health across waves) had small effect sizes or were not significant suggests that the hypothesized links are not as straightforward as expected. Causality and mechanisms may be challenging to establish, and the complex interaction of many variables can exert an influence on such hypothesized links. Although low income may be associated with stressors such as poor housing, crime, and stigma, there are also different protective factors that shape and modify the effects of economic status on mental health (Frankham et al., 2020). Future studies may investigate the factors that mediate and moderate the reciprocal relationships between economic status and mental health (e.g., Xue et al., 2021). In addition, future studies would complement this traditional variable-centered perspective (focused on the identification of the relationships between variables) with a person-centered perspective that aims at identifying the prevalence, the characteristics, and the predictors of typical patterns of the reciprocal relationships between economic status and mental health. This perspective may provide additional insights into these mechanisms linking mental health and economic status. For example, it may indicate that mental health and economic status are strongly interrelated in a group of people and not in others.

The findings of the current study suggest that the expected relationships derived from social drift/selection and social causation theories should be expressed in terms of variability in the overall level of mental health and economic status across people (the between-person effect) over a long-term period. Using a time lag of ten years between assessments, the predictions of social drift/selection and social causation theories received little support at the within-person level. A practical implication of the current study is that intervention should be targeted at reducing inequality in income or mental health within a nation or a community (between-person differences).[2]

Author statement

I am the solo author of this paper and I have managed the whole

[2] In response to an anonymous reviewer, the findings should not be interpreted as meaning that policy makers should not at least safeguard the variability over time of individual's economic status. Moreover, between-person effects should not be interpreted in terms of "comparing to the neighbour" effects, which are not tested here.

paper myself. There is no funding to report for this article.

CRediT authorship contribution statement

Gabriele Prati: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

I have no conflicts of interest to disclose.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2024.08.169.

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