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Abstract

The relative income hypothesis predicts poorer health in societies with greater income inequality, yet the psychological mechanisms that explain this association are not clear to date. This study tests the hypothesis that perceived age discrimination acts as a mediator in the inequality-health nexus for people who categorize themselves as old. It is expected that the detrimental mediating effect of perceived age discrimination does not occur for those who categorize themselves as young, since their low status is only temporary until they move to the higher status middle-aged group. A cross-sectional multilevel analysis of the 2008/09 European Social Survey (ESS, Round 4) was conducted. A subsample of respondents who perceive themselves as belonging to the old ($N = 10,650$) or young age group ($N = 15,635$) was analysed. The Gini coefficient was used to represent national inequalities in income in each of the 28 ESS countries. Mediation analyses within the multilevel structural equation modelling paradigm indicate that perceived age discrimination fully mediates the associations between income inequality and self-rated health for people who categorize themselves as old, but not as young. Our findings illustrate the importance of the socio-economic context as well as the permeability of group boundaries in the area of perceived discrimination and well-being.

Introduction

Health seems to be affected by a host of individual factors such as gender, education, subjective poverty and perceived social support (*e.g.*, Eikemo, Bambra, Judge, & Ringdal, 2008) when individual and regional variation was accounted for, by undertaking a multilevel analysis of the European Social Survey (2002 and 2004). Importantly, research suggests that the societal context in which individuals reside also matters for their health. In the 1990's epidemiologists started arguing that income inequality, *i.e.* the unequal distribution of wealth in society, may explain some of the cross-country differences in morbidity and mortality (see Kawachi & Kennedy, 1999). Although the so-called relative income hypothesis, which is postulating better population health in societies with less income inequality, has received mixed support (*e.g.*, Lynch, *et al.*, 2004), recent reviews and analyses with comprehensive national data corroborate the hypothesis at the country level (Ram, 2006; Wilkinson & Pickett, 2006; 2007).

To date, very few studies have examined the relative income hypothesis in regard to its psycho-social pathways (for an exception, see Vauclair, *et al.*, 2014), although a

promising mediator is the experience of discrimination. There are numerous theoretical accounts that link income inequality with greater prejudice in society - especially towards low status groups. It has been suggested that low status groups are evaluated more negatively in unequal societies (*e.g.*, Marmot, 2004) and that they have fewer opportunities for full social engagement and participation (Wilkinson & Pickett, 2009). Income inequality should give rise to individual and institutional discrimination due to a greater orientation towards hierarchy and social dominance (Sidanius & Pratto, 1999). Hence, people at the bottom of the societal hierarchy should be especially vulnerable to discrimination and prejudice in these societies. A link between inequality and prejudice has been empirically corroborated with data from the U.S. (see Wilkinson & Pickett, 2007). Moreover, there is cumulative evidence that the experience of discrimination is detrimental to people's physical and mental health (for a meta-analytical review, see Pascoe & Smart Richman, 2009).

Drawing upon these theoretical accounts and empirical findings, Vauclair *et al.* (2014) tested for the first time age discrimination as a psycho-social pathway in the inequality-health link among a sample of people aged 70 and older. In the present paper, we aim to go a step further and test the social psychological boundary conditions of this model. More specifically, we hypothesize that the experience of discrimination only acts as a mediator in the inequality-health link if individuals belong permanently to a low status group in society. For this purpose, the model is tested with individuals who categorize themselves as young or old. These two age groups are especially interesting because a curvilinear association has been reported which shows that younger and older adults are afforded a lower status in society than middle-aged adults (Abrams, Russell, Vauclair, & Swift, 2011; Garstka, Schmitt, Branscombe, & Hummert, 2004). However, a crucial difference between these two age groups is that younger people belong only temporarily to the low status age group before joining the higher status middle-age group, whereas older people's low status membership is permanent (Garstka, *et al.*, 2004). This difference in upward mobility should affect psychological responses to perceptions of age discrimination. In the case of people who see themselves as young, the experience of age discrimination has a transitory nature and, therefore, should be relatively unlikely to affect their sense of well-being. In the case of people, who see themselves as old, the experience of age discrimination represents a pervasive and negative consequence of their permanent group membership and should, therefore, be an important mediator for the inequality-health link.

Method

We used data from the European Social Survey and the module on Attitudes to Age and Experiences of Age Discrimination (European Social Survey Round 4 Data, 2008). The data were collected through computer-based personal interviews in 28 countries

from the European region. The data are based on random probability samples, which are representative of the eligible residential populations in each country (aged 15 years and over).

We used an item on self-categorization to split the samples into young and old age groups. Participants were asked to pick one of 9 boxes which best describe the age group they see themselves as belonging to. They were instructed to pick the first box, if they see themselves as very young and the last box, if they see themselves as very old and boxes in between for more nuanced age categorizations. We recoded the choice of the boxes 1 to 3 as young age categorization ($N = 15635$, $M_{objective\ age} = 28,62$, $SD = 10,56$) and 7 to 9 as old age categorization ($N = 10650$, $M_{objective\ age} = 70,14$, $SD = 10,40$)¹.

As a measure of subjective health, we used a five-point Likert scaled item that asks respondents “How is your health in general?” The response scales ranged from 1 = ‘very good’ to 5 = ‘very bad’. Health was defined as subsuming mental and physical health.

As a measure of perceived age discrimination, we used the following question which was measured on a five-point Likert scale: “how often in the past year has someone treated you badly because of your age, for example by insulting you, abusing you or refusing you services?” (0 = ‘never’, 4 = ‘very often’).

We also used the following socio-demographic measures from the ESS to control for their possible effects on subjective health (see *e.g.*, Eikemo, et al., 2008): gender (1 = male, 2 = female), education (ranging from 1 = ‘not completed primary education’ to 7 = ‘second stage of tertiary education’), subjective poverty as a psychological measure of socio-economic status (‘how do you feel about your household’s income nowadays?’ 1 = ‘living comfortably on present income’ to 4 = ‘finding it very difficult on present income’), social support (asking whether the person has someone to discuss intimate and personal matters with, 1 = ‘yes’, 2 = ‘no’), and social network (asking how often the person has social meetings with friends, relatives or colleagues; 1 = ‘never’ to 7 = ‘every day’).

As a measure of income inequality in countries, we used the Gini coefficient which is a measure of the inequality of income distribution, expressed as a percentage, from zero to 100 with higher percentages expressing more inequality. Data on Gini were obtained from Eurostat for the year 2008 as published on Eurostat’s Data Explorer webpage (http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di12&lang=en). The Gini coefficient used for Turkey was only available for the year 2006. We complemented Gini coefficients for Israel (from 2001), Russia (from 2006) and Ukraine (from 2006) from the World Income Inequality Database (<http://www.wider.unu.edu>).

We used multilevel modeling with the software Mplus 4.2 (Muthén & Muthén, 2007) for our analyses. We created a 2-1-1 multilevel mediation model within the SEM framework (see Preacher & Zyphur, 2011) meaning that the predictor (X) is at level 2,

¹Subjective and objective age correlate at the individual-level at $r = .83$, $p < .001$.

both the mediator (M) and the dependent variable (Y) are measured at level 1. Hence, we expected that income inequality (X) as a Level-2 antecedent influences the Level-1 mediator perceived of age discrimination (M) which then affects the Level-1 outcome subjective health (Y).

Similar to mediation in single-level data, we conducted the mediation analyses in three steps following Baron and Kenny's (1986) procedures: Step 1 showed whether there was a significant association between the independent and dependent variable (also called total effect or path c in the mediation model). Step 2 tested whether the independent variable is correlated with the mediator variable (path a). And Step 3 showed whether the mediator affects the dependent variable when using the independent and mediator variable as predictors (path b) (for more details, see also Vauclair, et al., 2014). We ran the multilevel mediation model for each (subjective) age group separately.

Results

First, we analyzed the data for respondents who categorized themselves as old. We found that 7.70% of the variation in perceived age discrimination and 15.40% of the variation in subjective health is associated with differences between countries. The total effect showed a significant positive association between income inequality and subjective ill-health, $B = 0.028$, $SE = 0.012$, $p < .05$. Figure 1 illustrates that on average older respondents perceived their health to be worse in countries with more income inequality than in countries with less inequality. We next tested whether the perception of age discrimination mediates the association between Gini and perceived ill-health of older people. Conducting Step 2 of our mediation analyses showed that older people perceived more age discrimination in more unequal countries than more equal ones, $B = 0.021$, $SE = 0.007$, $p < .01$. When taking into account perceived age discrimination, the positive relationship between Gini and subjective ill-health of older people disappeared (see Figure 2). The indirect effect was significant corroborating that there was a full mediation effect, $B = 0.016$, $SE = 0.008$, $p = .029$ (one-tailed)². Consistent with our hypothesis, this finding shows that older people perceived more age discrimination in more unequal societies, and this in turn explains why older people report greater ill-health in more unequal than equal countries.

We next repeated the specified mediation model, but included covariates at the individual-level that have been identified to be relevant predictors for health outcomes in past research. At the individual-level we found that age discrimination was a signif-

²Note that the findings are consistent with Vauclair et al. (2014) who performed similar analyses on older people using objective age (70+) as a categorization. We would like to emphasize that imposing objective age categories on respondents is relatively arbitrary in cross-country comparisons in which, for example, legal retirement ages vary widely. We think it is an important finding that results on subjective and objective age categorization converge.

icant predictor of subjective ill-health ($B = 0.070, p < .001$). Moreover, older people with a greater social network ($B = -0.052, p < .001$) and higher level of education ($B = -0.090, p < .001$) reported less ill-health. Women ($B = 0.110, p < .001$) as well as older people with no social support ($B = 0.049, p < .10$) and those who reported higher levels of subjective poverty ($B = 0.159, p < .001$) were more likely to report ill-health. The country-level effects were virtually the same after controlling for these individual-level variables and the indirect effect remained significant, $B = 0.015, SE = 0.008, p = .03$ (one-tailed), showing that age discrimination was a significant mediator even when taking into account important individual-level predictors of health.

We next repeated our analyses with the subsample of respondents that categorized themselves as young. The Gini coefficient significantly predicted perceived ill-health, $B = 0.015, SE = 0.007, p < .05$, although not as strongly as for the old age sample (see Figure 1). Societal income inequality did not reliably predict perceived age discrimination, $B = 0.000, SE = 0.004, n.s.$. Hence, Step 2 of the mediation analysis was not fulfilled and we were not able to proceed to test the mediation model. We still tested whether country differences in perceived age discrimination of young people are associated with country differences in reported ill-health and found the association to be non-significant, $B = 0.237, SE = 0.404, n.s.$

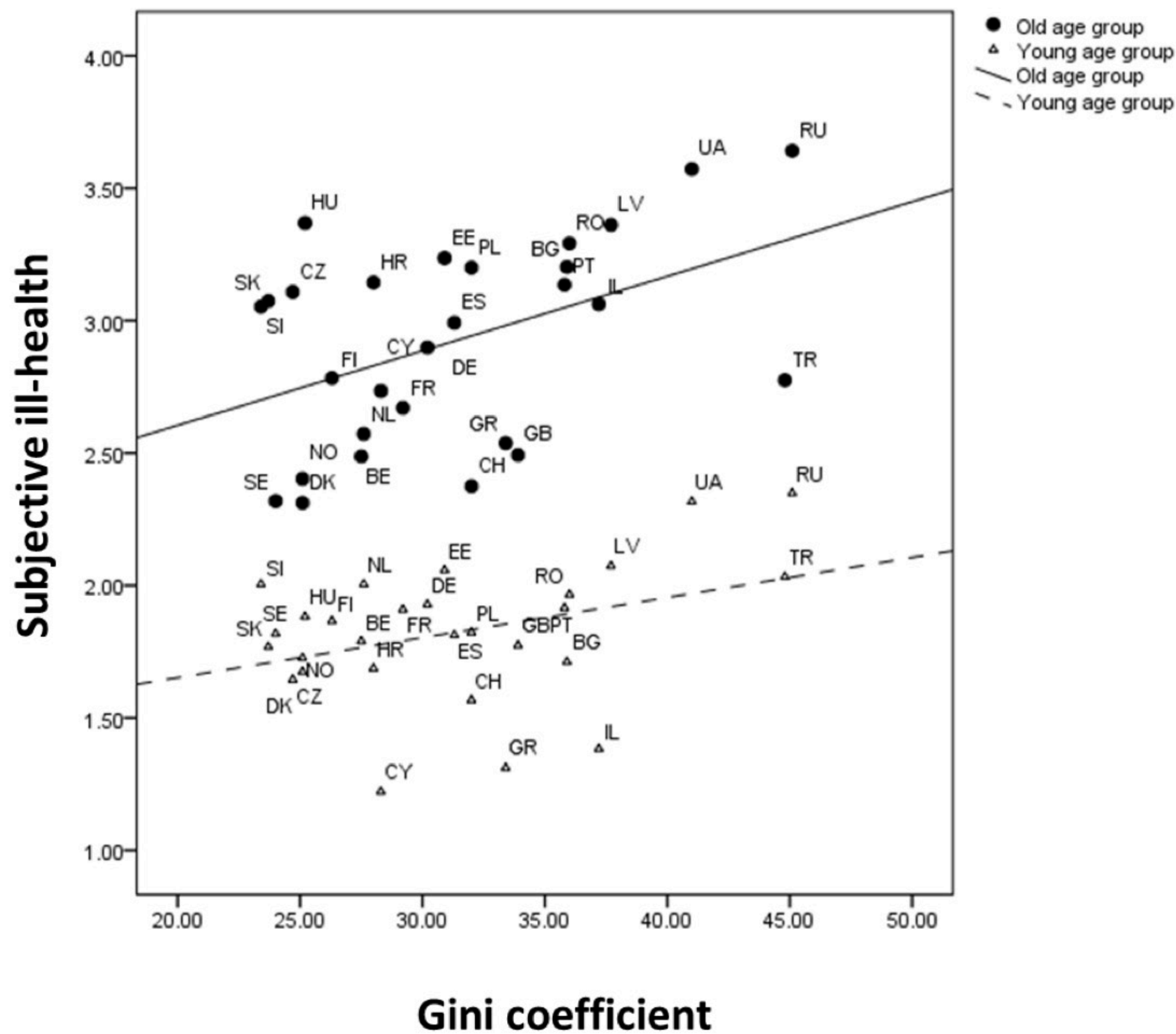


Figure 1
Overlaid scatter plot and best fitting regression lines showing average subjective ill-health scores of people categorizing themselves as old and young as a function of income inequality (assessed with the Gini coefficient).
Note: Belgium (BE), Bulgaria (BG), Switzerland (CH), Cyprus (CY), Czech Republic (CZ), Germany (DE), Denmark (DK), Estonia (EE), Spain (ES), Finland (FI), France (FR), United Kingdom (UK), Greece (GR), Croatia (HR), Hungary (HU), Israel (IL), Latvia (LV), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Russian Federation (RU), Sweden (SE), Slovenia (SI), Slovakia (SK), Turkey (TR), Ukraine (UA).

Discussion

We examined the relation between income inequality and subjective health across countries in the European region focusing on individuals who categorize themselves as young old. Consistent with our hypothesis, we found that respondents who regarded themselves as old reported greater ill-health in countries with more income inequality than in countries with less inequality. The association between income inequality and subjective health was fully explained by perceived age discrimination. Although population health is in general worse in more unequal societies (see *e.g.*, Wilkinson & Pick-

et, 2006, 2007), we expected the mediation model not to hold for those who consider themselves as young. Our rationale is that younger people may experience age discrimination due to their low social status; however, their belongingness to the low status age group is only temporary. Therefore negative psychological effects of discrimination should not be as detrimental as for those who belong to the low status group permanently (Garstka, *et al.*, 2004). Our findings fully supported these predictions.

It may be somewhat surprising that there is no association of inequality and age discrimination for people who categorize themselves as young, since we argued before that young people belong to a low status group and, therefore, should experience more age discrimination in unequal societies. However, it may be that younger people experience different forms of ageism than older people, for example, regarding alcohol use, voting rights, and licenses for driving and marriage (Gartska, *et al.*, 2004) which are largely the same across ESS countries and therefore cannot covary with income inequality. Nevertheless, it is noteworthy that we found a significant association between income inequality and health for the younger age group. Future research may aim to test the psycho-social pathways for the inequality-health nexus that apply specifically to younger people.

There are some limitations to consider when interpreting our results. First, it is important to recognize that our study is cross-sectional and therefore does not allow drawing definite conclusions about cause and effect. Secondly, we should be cautious about the generalizability of these findings to other regions of the world. By using a multilevel model, we made the assumption that our clusters can be regarded as a random sample from a wider population allowing us theoretically and statistically to infer our results beyond the countries that were used in the analysis. Considering that there are other relatively wealthy countries in the world with an even greater discrepancy in the distribution of income (*e.g.*, U.S.), we would expect to find the same or possibly even stronger effects with these countries. Finally, it is also important to acknowledge that although the measure of subjective health is an important indicator and on some occasions even more predictive of important outcomes (*e.g.*, mortality) than more objective indexes of health (Idler & Kasl, 1991), it is still important to explore the relationship of inequality and perceived discrimination with more objective measures of the functional health of older people.

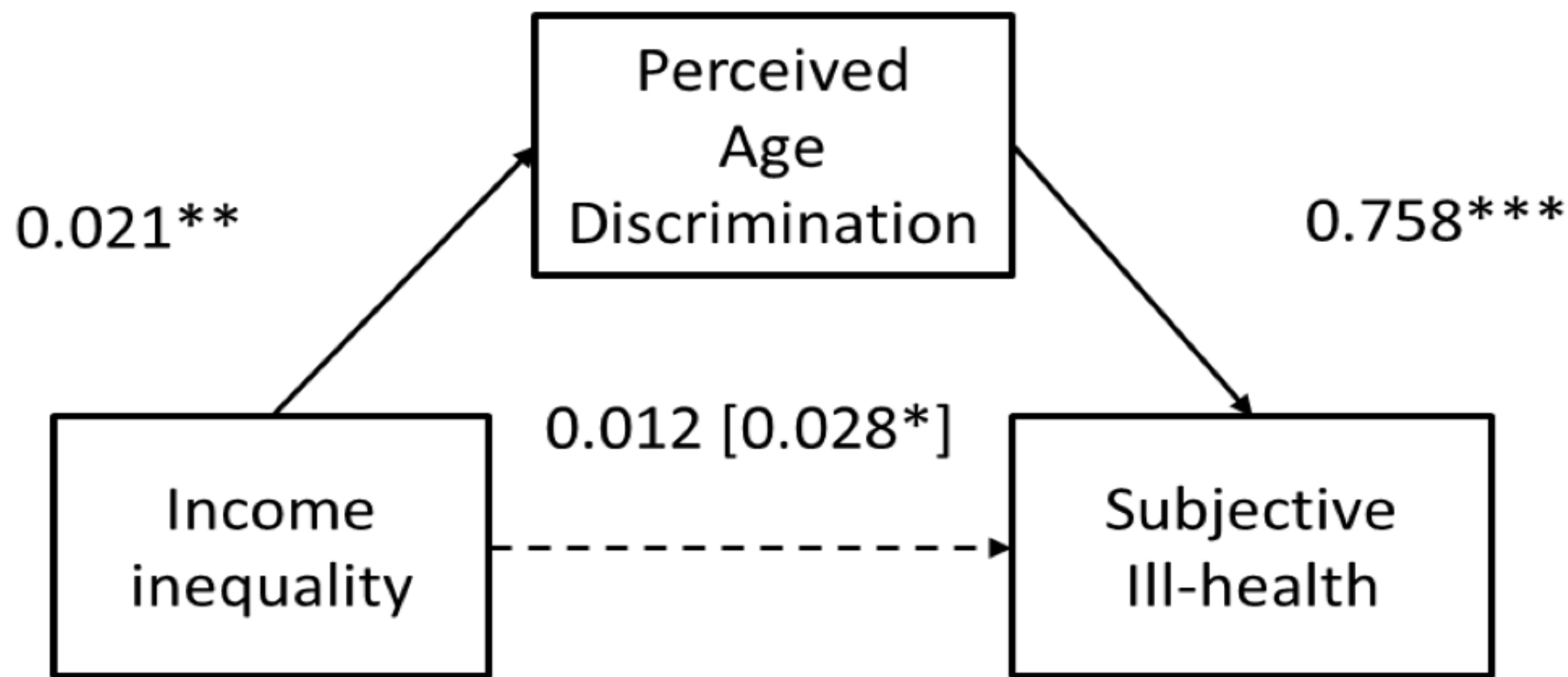


Figure 2

*Multilevel mediation model showing the association between income inequality and subjective ill-health as mediated by perceived age discrimination for respondents who categorized themselves as old. Regression coefficients are not standardized. The total effect (i.e., the association before including the mediator) is in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$.*

Combating age discrimination appears to be gaining momentum internationally (e.g., Stuckelberger, Abrams & Chastonay, 2012). From a policy perspective, efforts should be made to fight objective differences in treatment of different age groups at the institutional level such as in the access to work, health care and social services (Nelson, 2002), but also in the way older people deal with age discrimination. For instance, future research could examine factors that buffer or protect individuals against the stressful effects of age discrimination. The promotion of intergenerational contact is also a promising avenue as research has shown that intergenerational friendships reduce some of the negative impacts of age stereotypes on older people (Abrams et al., 2008; Abrams, Eller, & Bryant, 2006).

Author note

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