Relative deprivation: Measurement issues and predictive role for body image dissatisfaction

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ABSTRACT

The study of how relative standing in the socioeconomic hierarchy affects health outcomes faces a number of challenges. Two critical issues are the choice of the indicator quantifying relative standard of living and the collinearity which typically arises when absolute standard of living is controlled for. We address these issues by taking into examination linear and concave measures of relative deprivation and by showing that collinearity can be lessened through manipulations of the measures' formulae. Importantly, we argue that the two issues are intertwined and should be jointly considered by researchers. We illustrate the points above using nationally representative data from Mexico (N = 44,214) and studying relative deprivation as a predictor of body image dissatisfaction — a growing public health concern whose effects go well beyond eating disorders. Controlling for several individual characteristics, binary and multinomial logit regressions indicate relative deprivation as a risk factor for body image dissatisfaction. By conducting subsample analyses and by introducing an interaction term between gender and relative deprivation, we show evidence of a gender-based heterogeneity in the role of relative deprivation — which predicts feeling smaller than desired for both females and males and feeling larger than desired for females but not for males. This heterogeneity is discussed in the light of the different social pressures females and males face for slenderness and muscularity. Our evidence enriches the literature on socioeconomic gradients in health, pointing to an additional domain in which a low position in the socioeconomic ladder translates into greater likelihood of developing health problems and adopting health-compromising behaviors.

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1. Introduction

There is growing interest in the association between relative position in the socioeconomic hierarchy and health outcomes, with mounting evidence of relative deprivation as a significant predictor of health problems independent of the absolute level of standard of living (Kondo et al., 2008; Subramanyam et al., 2009; Salti, 2010; Mishra and Carleton, 2015; Elgar et al., 2016). This evidence tallies with the arguments proposed by Wilkinson (1996, 1997) and Wilkinson and Pickett (2007), according to which relative deprivation may jeopardize health outcomes directly through physiological effects of chronic stress and indirectly through greater

likelihood of behavioral risks triggered by psychosocial stress. The empirical analysis of the relative deprivation as a risk factor has covered an array of health domains, ranging from mortality (Kondo et al., 2015) to mental health (Wildman, 2003), functional disability (Kondo et al., 2009), subjective health (Saito et al., 2014), sexually transmitted diseases (Harling et al., 2014), etc. Beyond empirical contributions, papers like Adjaye-Gbewonyo and Kawachi (2012) and Côté-Lussier (2016) illustrate a number of conceptual and methodological issues concerning the use of relative deprivation measures as explanatory variables for health outcomes.

This paper aims to advance the study of relative deprivation in two directions: i) by providing a methodological contribution for the use of relative deprivation measures as explanatory variables for health and social outcomes and ii) by producing evidence of the association between relative deprivation and body image dissatisfaction (BID), a relationship which, to the best of our knowledge, has not been researched yet. On the methodological count,

alongside customary linear measures of relative deprivation we employ also concave measures, which differ in the assumptions made regarding the way higher standards of living impact on the individual. In addition, we address the problem of collinearity, which typically arises when absolute and relative measures of standards of living are used in the same regression as explanatory variables. We show that this problem can be lessened through manipulations of the measures' formulae, but at the same time, we argue that the issue of collinearity should be considered *in tandem* with the desirability of the functional form quantifying relative deprivation.

BID is the negatively evaluated discrepancy between people's perceived and desired physical appearances, a subjective evaluation which may occur irrespective of someone's objective body shape (Grogan, 2016). According to Bucchianeri and Neumark-Sztainer (2014), BID is an overlooked public health concern. Beyond playing a major role as a determinant for eating disorders (Stice et al., 2010; Rodgers et al., 2016), BID is increasingly found to be a potential risk factor for a number of health-related issues and health-compromising behaviors. These include mental illness and sexual functioning (Davison and McCabe, 2005), lower levels of physical activity (Neumark-Sztainer et al., 2006), binge drinking and drug consumption (Field et al., 2014), smoking (Kendzor et al., 2009), reluctance to undertake cancer screening (Ridolfi and Crowther, 2013), poorer physical health-related quality of life and psychosocial functioning (Wilson et al., 2013), inflammatory conditions (McDermott and Mulcahy, 2015) and emotional wellbeing (Gall et al., 2016). Grogan (2016) describes how a growing number of people, due to the anxiety they develop about their body figure and in the pursuit of unrealistic aesthetic ideals, resort to extreme dietary regimes, cosmetic surgery, slimming pills and anabolic steroids, in many cases jeopardising their health.

There are reasons to hypothesize that relative deprivation is a risk factor for BID. Body image is a dimension of a person's overall self-concept (Poloskov and Tracey, 2013), and we know that the self is deflated by the adverse psychosocial effects of lagging behind others, such as the frustration and the feeling of worthlessness arising from 'looking upward' and seeing more successful individuals (Wilkinson, 1996, 1997; Wilkinson and Pickett, 2007). Given that BID has a strong subjective component and is socially constructed (Tiggemann, 2004; Grogan, 2016), and in the light of evidence showing that relative deprivation cripples self-esteem (Callan et al., 2008), it is reasonable to hypothesize that the sense of inadequacy triggered by comparisons with better-off individuals affects also a sphere of self-appreciation such as physical appearance. We study the role of relative deprivation for the existence of BID as well as for the type of dissatisfaction (i.e. dissatisfied due to feeling smaller or larger than desired). Given the well-documented existence of marked gender-specific BID patterns, with females more likely to feel larger than desired whilst males smaller than desired (Fallonm and Rozin, 1985; Feingold and Mazzella, 1998; Furnham et al., 2002; Cho and Lee, 2013), we refine our analysis by studying gender subsamples as well as by introducing an interaction term between relative deprivation and the gender dummy — in this way also increasing our understanding of the interplay between relative deprivation and socio-demographic variables as advocated by Adjaye-Gbewonyo and Kawachi (2012).

2. Methods and data

2.1. Data and outcome variables

For our empirical analysis, we use the health and household modules of the *Encuesta Nacional de Salud y Nutricion 2012* (INSP, 2012), a Mexican household survey which is representative at national and state levels. The data collection was carried out by the Mexican National Institute of Public Health between October 2011 and May 2012, employing the 2010 National Census as a sampling frame. We used the adults' module, where one individual (aged 20+) was randomly selected and interviewed in each household. Surveyed adults were 46,277 and after cleaning the dataset we were left with 45,912 observations. We were able to employ 44,214 of them due to missing data in our dependent variables (1,618) and in our covariates (80).

Subjective assessment of body image was carried out through the widely-used Contour Drawing Rating Scale (Stunkard et al., 1983; Thompson and Altabe, 1991). This scale consists of nine drawings of a body figure in increasing order from very thin to very obese, with specific silhouettes for females and for males respondents as shown in Fig. 1 — for a detailed discussion of this methodology, see Gardner and Brown (2010). Respondents were asked to choose which silhouette they believe best represents their current body image and which silhouette represents their desired body image. Using these responses, we generated two dependent variables: *BIDb*, a binary variable which equals 0 if the two selected silhouettes coincide and 1 otherwise, and *BIDp*, a polytomous categorical variable accounting for the type of the dissatisfaction, with a value of 0 if the two silhouettes coincide, 1 if the respondents feels smaller than desired and 2 if she feels larger than desired.

2.2. Relative deprivation measures

Our measures of relative deprivation are based on an asset index (see subsection 2.3). The use of assets for the study of economic gradients in health is advocated by Pollack et al. (2007), Laaksonen et al. (2009) and Sweet (2011). In addition, Bertram-Hümmer and Baliki (2015) argue that their visible character makes assets particularly suitable for the construction of relative deprivation measures. Our first measure of relative deprivation is the Yitzhaki (1979) index, which is based on the difference between individual i's achievement and the achievements of better-off individuals in her reference group. We use a geographical criterion for the definition of the reference group (people in the same state, so that there are 32 reference groups), and carry out robustness checks narrowing down this criterion further by age and by gender — results are qualitatively unchanged and are made available in the supplementary online material. Denoting individual i's and individual j's levels of wealth with y_i and y_j, respectively, we use the Yitzhaki index $RDY(y_i, y_j) = \sum_j (y_j - y_i)/N, \forall y_j > y_i$, where N is the size of the reference group. The Yitzhaki index has been extensively used in health research, and we refer the reader to Adjaye-Gbewonyo and Kawachi (2012) and Côté-Lussier (2016) for the discussion of a number of important issues (alternative normalizations, inclusion of the cumulative distribution, etc.). A remark worth noting is that, while Yitzhaki (1979) does build upon Runciman's (1966) theory of relative deprivation, in his approach 'there are no individual comparisons' — as the author himself clarifies (Yitzhaki, 1980, p. 575). In Yitzhaki's framework, each level of income represents the ability to consume a certain bundle of commodities and individual i's relative deprivation is the aggregate value of the bundles she is not able to consume. This means that, strictly speaking, the adoption of the Yitzhaki's framework is not necessarily dependent on the idea that people actively engage in interpersonal comparisons, which is instead the alternative motivation for the Yitzhaki's framework proposed by Hey and Lambert (1980) — see also Anonymous (2017).

The second measure we employ is a 'frugal' version of *RDY*, which we derive by simply averaging higher wealth levels in the reference group rather than wealth differences: