Shifts in subjective well-being of different status groups: A longitudinal case-study during declining income inequality ☆

Ragna B. Gardarsdottir[a,*], Rod Bond[b], Arndis Vilhjalmsdottir[a], Helga Dittmar[a,b]

[a] *University of Iceland, Faculty of Psychology, Oddi, Sæmundargötu 2, 101 Reykjavík, Iceland*
[b] *University of Sussex, School of Psychology, Pevensey 1, Brighton, England, BN1 9QH, United Kingdom*

A B S T R A C T

Theory holds that as income distribution becomes more equal, the well-being of those of low socioeconomic standing increases, since their relative status is improved. In this study we measure changes in individual subjective well-being (SWB) over a three year period of declining income inequality in Iceland. Using growth mixture modelling, we identified two groups whose well-being trajectories differ. One group ($n = 540$) whose SWB was initially high but then declined slightly, and a second group ($n = 110$) whose SWB was initially low, but improved over time. This second group had lower socio-economic status and stronger materialistic values. These differing shifts in SWB coincide with diminishing income inequality and class division and the results are consistent with the status anxiety explanation of the income inequality hypothesis. Our findings suggest the need to examine separate trajectories of distinct socioeconomic groups in societies generally regarded as egalitarian, and examine the role of a materialistic value orientation further.

1. Introduction

In October 2008, Iceland's financial system famously crashed as its three largest banks were nationalized.[1] In the years leading up to the crash, income inequality in Iceland had reached unprecedented heights, as can be seen in Fig. 1. Immediately following the financial crash, however, income inequality levels were again sharply reduced to their pre neo-liberal era levels (Standardized World Income Inequality Database, n.d.). Although the decrease in income inequality happened largely because of income reduction and loss of capital gains among top-earners, it was also a result of radical changes in tax-policy aimed at protecting low-earners (Ólafsson & Kristjánsson, 2013, 2017). Thus, although both the high and low earners became poorer in absolute terms, the *relative standing* of the lower earners improved, due to a more equal income distribution.

Icelanders have normally considered themselves a classless, egalitarian nation with a particularly even income distribution (Bernburg & Olafsdottir, 2012; Oddsson, 2016). Being accustomed to equality, Icelanders are sensitive to departures from egalitarian norms. The rise and decline in GINI did not go unnoticed among Icelanders and as can be marked by results showing that alongside the rise in income inequality, they perceived increases in class division, which then subsided together

with decreased inequality after the financial collapse (Oddsson, 2016). Moreover, as the recession deepened following the collapse, the majority of Icelanders perceived improvement in their own subjective social location (Oddsson, 2017).

Both the economic bubble with its steepening of the socioeconomic hierarchy and the consequent financial collapse affected the social fabric of Icelanders. The 'invasion' of neoliberal thinking that started in Iceland in the late Reagan-Thatcher era led steadily to privatization and free market policies opening up markets previously unavailable to Icelanders (e.g. Bernburg, 2016; Ólafsson & Kristjánsson, 2017). This led to the so-called "*outvasion*" of the Icelandic "*business-Vikings*"; entrepreneurs who then used their borrowed cash to purchase the three Icelandic state banks in 2003. With that, a new elite emerged. They were Iceland's 1%, mostly consisting of the generously compensated bankers and staff from associated firms. This elite embarked upon conspicuous consumption and luxury living at levels never before witnessed in Iceland (see e.g. Bernburg, 2016; Garðarsdóttir & Dittmar, 2012; Oddsson, 2016).
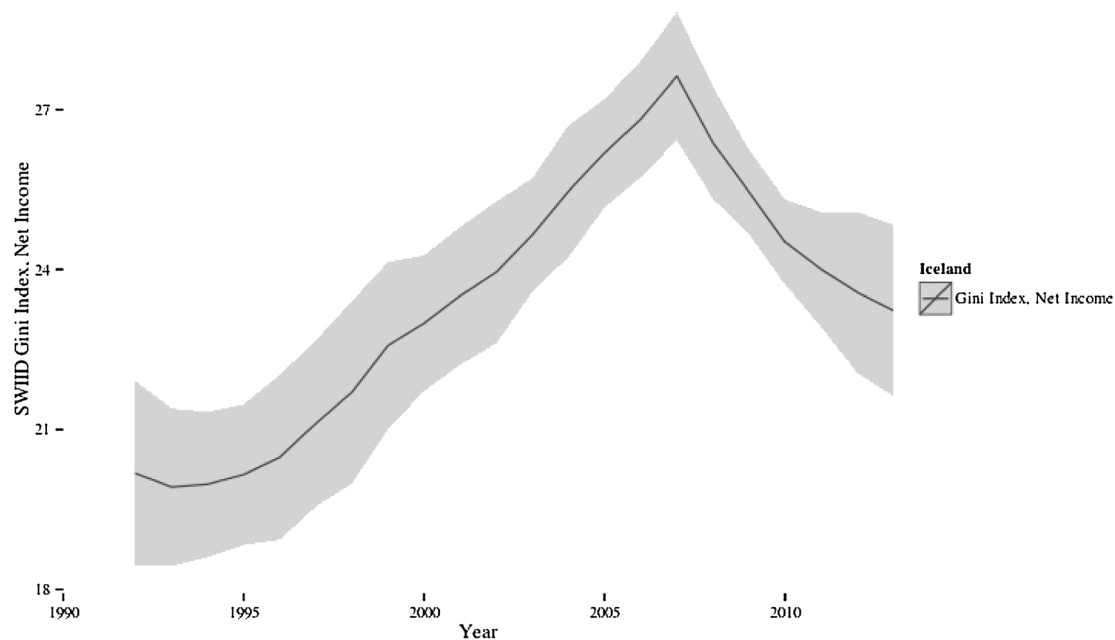
There is evidence that this elite had a strong influence on the normative standard of living for the rest. For example, during the economic boom the privatized banks offered and promoted cheap credit resulting in an increase in household debt, reaching 255% of aggregate

Note: Solid lines indicate mean estimates; shaded regions indicate the associated 95% confidence intervals.
Source: Standardized World Income Inequality Database v5.0 (Solt 2014).

Fig. 1. GINI index for net income in Iceland from 1993 to 2013. (Standardized World Inequality Database v5.0; Solt, 2014).

disposable income (Garðarsdóttir & Dittmar, 2012; Johnsen, 2014). One study showed that amount of household debt was related to levels of materialism, but unrelated to income, indicating that Icelanders engaged in status-seeking consumption far outstripping their objective economic status (Garðarsdóttir & Dittmar, 2012).

Moreover, the observed discrepancy between the newly rich elite and the general public may have generated worries about status and material standing beyond what Icelanders were used to. According to the Income Inequality Hypothesis (IIH), such worries become more prevalent as the socioeconomic hierarchy becomes steeper, particularly in affluent societies (Wilkinson & Pickett, 2017), such as Iceland. These worries are subsequently manifested in a deterioration in health and well-being (Wilkinson & Pickett, 2017, 2009).

The observed shifts in income inequality and social divisions, in a relatively short period of time in Iceland offer an ideal "natural experiment" (Craig et al., 2012) for exploring the development of well-being for groups of differing socioeconomic status. We do this by applying the IIH to a sample of Icelanders that may be expected to have different well-being trajectories during a time when Icelandic society became more equal.

1.1. The income inequality hypothesis and well-being

The income inequality hypothesis (Kawachi & Subramanian, 2014; Wilkinson & Pickett, 2009) states that, in affluent societies, inequality in individuals' income negatively affects health and well-being over and above the effect of individuals' absolute income. Although contested (Avendano & Hessel, 2015; Eckersley, 2015; Lynch et al., 2004; Präg, Mills, & Wittek, 2013; Rambotti, 2015), the IIH is supported by a growing body of empirical studies. Still, the literature lacks consensus about two issues: the mechanisms through which income inequality generates this adverse effect and who is affected (Schneider, 2016).

With respect to how inequality, a macro characteristic, impacts individual psychological well-being, scholars have proposed two broad, probably related, categories of psychosocial mechanisms; 1) a deterioration in social capital and 2) an increase in status anxiety. The first category consists of explanations related to societal divisions. Wilkinson and Pickett (e.g. 2017) claim that inequality creates boundaries

between groups or classes, reducing social cohesion, including generalized trust and social-capital, which in turn undermines emotional well-being (Kawachi & Berkman, 2000, 2001; Thoits, 2011).

The second category consists of explanations related to differences in material status and self-worth. Such explanations are often referred to as the status anxiety hypothesis (Delhey, Schneickert, & Steckermeier, 2017; Layte, 2012; Layte & Whelan, 2014). According to the status anxiety hypothesis, status and income differences become more salient as income inequality increases. Growing status differences may, in turn, cause people to worry about their social status, leading to insecurity and inadequacy in relations to others, directly affecting their psychological well-being (Wilkinson, 1999; Wilkinson & Pickett, 2017).

The status anxiety version of the IIH has been backed up with research showing that indicators of status anxiety may mediate the association of income inequality and mental well-being (Layte & Whelan, 2014), and studies showing that social comparison and relative deprivation may play a role in shaping individual health and mental well-being (Åberg Yngwe, Fritzell, Lundberg, Diderichsen, & Burström, 2003; Ladin, Daniels, & Kawachi, 2010; Lee & Kawachi, 2017).

Wilkinson and Pickett (2017) note that although this mechanism may be particularly detrimental to those of low social status, those belonging to the higher end of the socioeconomic hierarchy may also feel the pressure of maintaining their social status. Thus, they claim, while there may be a social gradient in the detrimental effect of income inequality, it may nevertheless be felt by all society members. Yet, the research literature is not in agreement about whose well-being is primarily affected by income inequality: all citizens equally within society or only selected groups. According to the *strong* or absolute version of the IIH, everyone in society is equally negatively affected as inequality grows (Lynch et al., 2004; Mellor & Milyo, 2002). According to the *weak* or relative version, however, income inequality negatively affects those with lower incomes more than those with higher incomes, due to the status anxiety experienced by those who have a relatively low socioeconomic standing in society (Brunner & Marmot, 1999; Layte & Whelan, 2014; Marmot, 2006; Wilkinson & Pickett, 2006).

Several studies have supported the weak version, both across regions and across time. In Iceland, a population study of emotional problems among adolescents in 2006 (high income inequality and 2014 (low income inequality) showed that high levels of income inequality in

2006 harmed primarily the well-being of adolescents of low socio-economic standing, but that there was no association in 2014 (Vilhjalmsdottir, Bernburg, Gardarsdottir, & Sigfusdottir, 2018). Similar results, indicating that the effect of income inequality may depend on individuals' socioeconomic status, have been found in Norway (Dahl, Ivar Elstad, Hofoss, & Martin-Mollard, 2006), and Sweden (Henriksson, Weitoft, & Allebeck, 2010). Comparing the happiness levels of Americans from 1972 to 2008, Oishi, Kesebir, and Diener (2011) found that the happiness of low income groups was higher during periods of low income inequality, and that the negative association between income inequality and happiness only held for lower-income respondents. Finally, supporting both the relative-status and the weak versions of the IIH, a cross-cultural analysis shows that levels of status anxiety are inversely related to income and that this negative association is especially pronounced in countries where income inequality is high (Layte & Whelan, 2014). These findings, by implication, also mean that when inequality drops and socioeconomic hierarchy levels off, social evaluation should be relatively more favourable for the lower-income groups, resulting in enhanced well-being.

1.2. Socio-economic status and material value orientation

Absolute income and material possessions are major benchmarks of onés place in the socioeconomic hierarchy in western consumer cultures (Dittmar, Bond, Hurst & Kasser, 2014). Since the dominant western meritocratic and individualistic ideology holds people personally responsible for their place in the socioeconomic hierarchy, lack of income and possessions can easily translate into feelings of shame and worthlessness. Therefore, when status differences become salient during times of high income inequality, people of low socioeconomic status experience a thwarting of socially accepted material possessions and life-opportunities. This results in "social evaluative stress" or social anxiety described as the fear of "…failing to conform to the ideals of success laid down by our society and that we may as a result be stripped of dignity and respect…" (DeBotton, 2004, pp. vii–viii).

A materialistic value orientation may be particularly detrimental for the well-being of individuals who live in countries with greater income inequalities and may influence how that person experiences their status within a stratified society. Materialism has been defined as "individual differences in people's long-term endorsement of values, goals, and associated beliefs that center on the importance of *acquiring money and possessions that convey status*" (Dittmar et al., 2014, p. 880, emphasis added). Dittmar's et al. (2014) meta-analysis showed that a materialistic value orientation is linked robustly and consistently to lower personal well-being. Materialistic values are also associated with greater anxiety and more negative self-appraisals, such as lower self-esteem and greater self-discrepancies (Dittmar, 2008). Evidence shows that, compared to affluent people, the less affluent are more likely to hold materialistic values (Chaplin, Hill, & John, 2014), and to equate happiness and success with money and possessions (Garðarsdóttir, 2006; Roberts & Clement, 2007). Those who hold this double disadvantage of being materialistic and of lower-socioeconomic standing may be especially vulnerable to suffering during high income inequality since they are likely to engage in upwards social comparisons, leaving them feeling relatively deprived.

Consequently, following the weak or relative version of the IIH, a sharp drop in income inequality in Iceland may have benefited those of low-socioeconomic standing, since their relative standing in society is affected by shifts in the societal income distribution (Subramanyam, Kawachi, Berkman, & Subramanian, 2009; Wilkinson & Pickett, 2007). In contrast, for high income groups, well-being may be unaffected, or even deteriorate.

1.3. The present study

Research on the potential effects of income inequality on health and well-being has generally assumed an increase in income inequality and a decrease in health. Unsurprisingly, given the current global trend, longitudinal studies on well-being during declining income inequality are lacking. Yet, it is inherent in the IIH that a decrease in inequality should result in better well-being.

In this paper we present findings from a three-time point longitudinal study conducted in Iceland in the first three years after the economic crash: 2009, 2010, and 2011. During this time income inequality rapidly declined as the Icelandic economy recovered. We take advantage of that unique societal backdrop to map the extent and nature of shifts in Subjective Well-Being (SWB) among a sample of Icelanders in the years following the crash. The same respondents completed questionnaires on SWB, materialistic value orientation, and a host of demographic and well-being measures on three occasions. We choose to measure SWB as our core variable since it is a broad, meaningful, and widely used assessment of both cognitive and emotional evaluations of one's life (Diener, Oishi, & Lucas, 2002).

Our research is an exploratory study aimed at examining three research questions relating to the weak and status anxiety versions of IIH. The first question is whether well-being levels have shifted over time, parallel to shifts in inequality, and if so, whether well-being shifted differently in different subgroups. Secondly, we test whether subgroup membership can be predicted from measures of socio-economic indicators and materialism, as the status anxiety hypothesis and weak version of the IIH would predict. Thirdly, we examine simultaneous changes in other measures of well-being, which have been shown to be linked with materialism and which may be affected by inequality. We use Growth Mixture Modelling (GMM) (Muthén, 2004; Muthén & Asparouhov, 2009; Muthén & Shedden, 1999) to a) identify subpopulations with different SWB trajectories b) to estimate within-class predictors of growth and c) to estimate correlates of subgroup membership.

2. Method

2.1. Procedure and sample

A questionnaire along with information and instructions was set up online. Participants were recruited via a snowballing method. An E-mail with a link to the online questionnaire was sent to Icelandic contacts of the research team and they were asked to complete the questionnaire and forward the link to their contacts, who, in turn, were asked to forward the link on. Directions were given to participants to pass the questionnaire on to Icelandic adults (over 18 years of age). Participants were assured of their anonymity, their right to withdraw from the study, and their right to refuse to answer particular questions. Participants in the first wave were asked whether they could be contacted for the second and third waves of the study. Those participants who agreed were sent an E-mail 9 and 18 months later with a link to a slightly modified questionnaire. Participants' responses were matched via a unique identifier code, which they, themselves, provided.

The full sample comprised 736 respondents, thereof we deleted 86 cases who did not complete any wave or the SWB subscales resulting in a final sample of 650 respondents. A total of 295 participants completed all three waves, an additional 95 participants completed two waves and the remaining 260 only completed one wave of data collection. Each wave was treated as completed if the participant responded to at least 10 scales in the questionnaire (out of 12). In order to be included in the present analyses, a participant needed to have completed the SWB measures on at least one measurement occasion. Missing data on SWB was dealt with by data imputation through full information maximum likelihood (FIML, Enders, 2010). Anyone who had completed at least one wave was included in the analysis and any missing values on other waves are taken account of using FIML. Missing data on covariates was handled by data imputation as described below in Section 3.3.1.

At the time of the first wave of data collection in 2009, respondents'

age ranged from 18 to 71 years, with median age being 37 years (M = 38.09 years; SD = 10.64). As is to be expected in surveys depending on volunteers (Elmes, Kantowitz, & Roediger, 2006) our sample was not representative of the population in terms of gender and education. Participants were mostly female (77%) and a majority (60%) of the participants had a university degree, whereas in 2009, only 32.9% of the general population in Iceland had completed a university degree or higher (Statistics Iceland, n.d.-a). In our sample, 54% of respondents were in professional occupation, roughly corresponding with the general population in 2009 (48.5%, Statistics Iceland, n.d.-b). Household income ranged from below 50,000 ISK per month to above 2 million ISK per month, with the average income in the range of 500,000–599,999 ISK. All respondents were Icelandic citizens and almost all (92%) were of Icelandic origin.

2.2. Measures

Subjective well-being. To measure the cognitive component of SWB we used the Satisfaction with Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985). It consists of 5 items ('If I could live my life over, I would change almost nothing'), which were measured on 7-point Likert-type scale, ranging from *completely disagree* (1) to *completely agree* (7). To measure positive and negative affect, a shortened 10-item version of the Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988) was used. PANAS asks people to rate the extent to which they have experienced positive ('interested', 'excited') or negative affect ('upset', 'guilty') in the past few weeks on a five point scale ranging from *very slightly or not at all* (1) to *extremely* (5). To test whether these three scales form a single latent SWB factor we ran confirmatory factor analyses of SWB at each time point including the Satisfaction with Life Scale, Positive Affect and Negative Affect as indicators of SWB. Fit indices indicate an excellent fit χ = 23.33 (df = 15; N = 647; p = 0.08); CFI = 0.995; RMSEA = 0.029; SRMR = 0.24; hence they were combined to form a single scale. To form the scale we first reverse scored the negative affect items and then standardized each subscale – Satisfaction with Life, Negative Affect and Positive Affect within wave, and finally summed the standardized scores to form the scale.

Materialism was assessed using the total mean scale score of the 9-item version of the Materialistic Values Scale (MVS) (Richins, 2004). The nine-item version possesses acceptable levels of reliability and validity for measuring overall materialism and assesses all three domains of materialism measured in the original 18 item MVS; 'Success' (The things I own say a lot about how well I'm doing in life), 'Happiness' (I wouldn't be any happier if I owned nicer things (rev.)) and 'Centrality' (I try to keep my life simple as far as possessions are concerned (rev.)). The items were rated on a 7-point Likert-type scale, ranging from *completely disagree* (1) to *completely agree* (7). Internal consistency of the scale was very good, α = 0.85, α = 0.83, α = 0.84 at times 1, 2, and 3 respectively.

Self-esteem was assessed using a single item 'I have high self-esteem' (Robins, Hendin, & Trzesniewski, 2001) which was rated on a seven point Likert-type scale ranging from *completely disagree* (1) to *completely agree* (7). The single item measurement has been shown to be highly correlated with the Rosenberg self-esteem scale with equal predictive validity (Robins et al., 2001).

Self-discrepancy was assessed with the Self-discrepancy Scale that was developed for the purposes of this study.[2] The scale consists of eight items that were rated on a 7-point Likert-type scale, ranging from *completely disagree* (1) to *completely agree* (7). The items reflect both importance of perceived discrepancy between ideal and actual self (e.g. 'I think a lot about being different from how I am') as well as the

perceived distance from actual to ideal self (e.g. 'I am far away from how I would like to be ideally'). Internal consistency of the scale was excellent, α = 0.94, α = 0.92, α = 0.93.

Stress and anxiety. The 7-item stress and anxiety subscale from the General Health Questionnaire (GHQ) (Goldberg, 1972) was used as a measurement of stress and anxiety. GHQ is a self-report questionnaire, designed to screen for minor psychiatric disorders or changes in mental health in general settings. The response alternatives in our surveys were altered from the original version: The participants were asked to bear in mind how they had felt the past few weeks when they answered the seven items on a 5-point frequency scale, ranging from *never* (1) to *all the time* (5). The internal reliability of the seven items were good, α = 0.87, α = 0.83, α = 0.85.

Income was assessed on a 23-point scale where each point represented a range of monthly income in Icelandic krona (ISK). The first two categories were, "under 50,000 ISK" and "ISK 50,000–ISK 99,999", and the next two categories covered ISK 100.000–ISK 199, 999 in ISK 50,000 intervals. Thereafter, each category was a 100,000 interval up to the last category which "ISK 2 million or more". We decided to combine the first categories, and the second two categories, so that each category covered ISK 100,000. Notwithstanding the open-ended first and last categories, we treated income as a continuous scale.[3]

Education was assessed on a four-point scale ranging from elementary education to a postgraduate university degree. For the current analysis we decided to create a binary variable dividing the sample into those who had a university degree or higher (60%) compared to those who did not.

Occupation was assessed using a 12-point scale using the 11 major groups of the ISCO-88 classification (International Labour Office, 1990) as well as options for the unemployed and students. For the current analysis we divided the sample into those who had a professional occupation (54%) compared to those who did not. We defined professional occupation as the first three categories of the ISCO-88 classification: 1) Legislators, senior officials and managers, 2) Professionals and technicians and 3) Associate professionals. The non-professional group consisted of 16% students and 30% from other ISCO-88 classes of occupation.

3. Analyses and results

Growth Mixture Modelling (GMM) analyses were carried out using Mplus Version 8 (Muthén & Muthén, 1998-2017). We used 1000 initial random sets of starting values and 100 final stage optimisations. All analyses were run twice to check that the results replicated.

With just three time points, we must assume that the form of the growth model was linear since nonlinear functions would require more time points. We coded time so that the intercept represented initial status and the slope factor represented change from one time point to the next. In growth mixture modelling (Muthén, 2004; Muthén & Asparouhov, 2009; Muthen & Shedden, 1999), the assumption is that individuals are drawn from two or more subpopulations, each of which is characterized by a distinct growth trajectory. Instead of assuming that, for the population as a whole, individual variation in the growth factors is normally distributed about a population average, it is assumed that the population distribution is a mixture of distributions from heterogeneous subpopulations and will therefore be non-normal. These subpopulations are unobserved, and the goal of the analysis is to identify them.

As well as identifying subpopulations, we are also interested in identifying predictors of class membership. There are two ways of doing

---

[2] Guðnadóttir and Garðarsdóttir (2013) report properties and predictive validity of the scale.

[3] Participants indicating "Less than ISK 50,000" as their monthly income were n = 5 (0.8%) and those indicating "ISK 2million or more" were n = 15 (2.5%). In view of these low frequencies, it was felt that treating income as a continuous variable would be acceptable. At the time of assessment 1 US$ = 125 ISK.

this. In one, the "1-step" approach, covariates are directly specified in the GMM model in a multinomial logistic regression where class membership is the dependent variable. However, the direct specification of covariates can affect the number and type of latent classes, especially when class separation is not strong (Aparouhov & Muthen, 2014; Vermunt, 2010). To avoid this potential problem, an alternative "3-step" approach has been proposed, in which an unconditional GMM model is estimated in the first step, derives a latent class indicator, including class uncertainty, in the second step, and then include covariates as predictors of the class indicator in the third step (Asparouhov and Muthen, 2014; Vermunt, 2010; Wickrama, Lee, O'Neal, & Lorenz, 2016). We have adopted the three-step approach.

3.1. Determination of the number of latent classes

3.1.1. Statistical analysis

The determination of the number of latent classes to extract in GMM is a complex topic. Even though we are here concerned only with a linear growth model in each class, and therefore do not consider the possibility of other functional forms for modelling growth, there are a large number of possible models depending on how the covariance of the residuals are specified and how the covariance of the growth factors are specified, and the specification of these two matrices, the residuals and the growth factors, can affect the number of classes identified (Enders & Tofighi, 2008; Diallo, Morin, & Lu, 2016; Morin et al., 2011).

For the matrix of residuals associated with the observed measures at each time point (Θ), it is normal practice to assume that this is a diagonal matrix, i.e., that the residuals are uncorrelated across time and hence the correlations between observed measures over time is entirely accounted for by the growth factors (Grimm, Ram & Estabrook, 2017; Wickrama et al., 2016). There is, though, the question of whether to constrain residuals to be equal across time or across groups. Some recommend that residuals are homogenous across time (Diallo et al., 2016; Grimm et al., 2017) whereas others favor time specific residuals (Wickrama et al., 2016). For either specification, there is then the question of whether residuals should be homogenous across classes or allowed to vary. Petras and Masyn (2010) recommend beginning the class enumeration process with the residual covariance matrix homogenous across classes.

In our analyses, we specified that the residual covariance matrix is diagonal and that residuals should be allowed to vary across time, as favored by Wickrama et al. (2016). We have also specified that the time-specific residuals are homogenous across classes, as there is no good reason to expect that residual variance should vary by subpopulation.

Aside from the specification of the residual matrix, there is also the question of how the covariance matrix of the growth factors (Ψ) is specified. When fitting a simple linear model, this matrix comprises the variances of the random intercept and random slope factors, and their covariance. These variances may or may not be fixed to zero, and they may be homogenous across latent classes, or free to vary across classes.

We decided not to specify Latent Class Growth Analysis (Nagin, 2005) models, where the variances are fixed at zero, because they tend to result in the overextraction of latent classes (Bauer & Curran, 2004; Diallo et al., 2016) and because we wished to allow for individual variability around the average linear growth trajectory for each class. Instead, we have adopted two different specifications of the covariance matrix of the growth factors. The first, following the recommendation of Petras and Masyn (2010), is a diagonal matrix where the variances are not constrained but the covariance is fixed at zero, The second is where there are no constraints on the variances or the covariance. For each type of model, we compare a specification where Ψ is homogenous across classes with one where Ψ is free to vary across classes.

3.1.2. Results

Table 1 presents the results of fitting these various models and

shows, first, that two class models fit better than a one class model. This means that the data contain two subpopulations with differing trajectories of SWB over time. This is evident from the lower values for BIC and ABIC. The largest difference in BIC values is 5722–5662 = 60, which is very strong evidence in favour of the two-class model (Raftery, 1995). Moreover, both the VLRT and BLRT indicate that a two-class solution is significantly better than a one-class solution.

We also examined whether a three-class solution is a better fit than a two-class solution. For models where Ψ is a full matrix, the three-class solutions were improper, i.e., they had negative variances, for both the model where the covariance matrix is homogenous across classes and that where it is free to vary. For the models where Ψ is diagonal, the model where Ψ is free to vary gave an improper solution. Where it is homogenous, the three-class solution was not improper. It did not provide a better fit than the two-class model according to the VLRT, but it did for BLRT. However, the third class comprised just 26 individuals – 4% of the total sample – and this is deemed too small. We decided, therefore, to adopt a two-class model. Here the smaller class has 110 respondents (17%) of the sample, and class separation is reasonably good with entropy equal to 0.77.

With respect to whether the Ψ matrix should be free or constrained to be equal across classes, for the diagonal Ψ models, the BIC for the homogenous model is lower than that for the heterogeneous model, whereas for ABIC it is the reverse. Entropy, though, is much better for the homogenous model. For the full Ψ models, the heterogeneous model gives an improper solution. On this basis, we chose a homogenous model. As for the choice between the diagonal Ψ matrix and the full Ψ matrix, the ABIC is almost identical for the two models; BIC is marginally better for the full Ψ model. In the full model, the covariance between the intercept and slope factors was not significant ($z = 0.75$, $p = 0.45$), and so we adopted the model where Ψ is diagonal as it is more parsimonious.

3.2. Growth trajectories of each latent class

Table 2 shows the parameters for each latent class and Fig. 2 plots the mean and estimated mean growth trajectories for the two classes. Class 1 is much larger and comprises 83% of the sample ($n = 540$). This group initially has higher SWB than class 2 but over time, on average, their SWB decreases somewhat. The slope mean is -0.21 and, therefore, the average change from time 1 to time 3 is -0.42, corresponding to about one fifth of a standard deviation, a small effect (Cohen, 1988).

Class 2, on the other hand, comprises 17% of the sample ($n = 110$) and represents a group whose SWB initially is low but whose well-being steadily increases over this period. The slope mean is 0.94, meaning that the well-being of members of this group increased by 1.88 from time 1 to time 3, which is almost one standard deviation, $s = 2.30$, representing a large effect (Cohen, 1988). This is a significant increase.

The means and estimated growth means are comparable, indicating that the growth mixtures are not driven by non-linear change within-persons.

3.3. Characteristics of the two subpopulations

3.3.1. Statistical analysis

Next, we examined what differentiates our two subpopulations. We predict class membership from demographic variables and materialistic values. The demographic variables were gender, age, income, educational background and occupation. Because Mplus eliminates cases with missing values on exogenous variables, we used the expectation-maximization (EM) procedure from SPSS 21 Missing Values to impute values conditional on all other predictors in the study. We centred all covariates.

3.3.2. Results

The results can be seen in Table 3. First, each covariate was entered

Table 1
Specification and fit of models varying the number of latent classes and constraints on variance parameters.

Model	Θ_k	ψ_{11}	ψ_{22}	ψ_{12}	LL	#fp	SF	BIC	ABIC	VLMR	BLRT	Entropy	N_{min}
One class	*	*	*	*	−2835.292	8	1.2788	5722.399	5697.000	NA	NA	NA	650
Ψ diagonal (ψ₁₂ = 0)													
2 classes													
Homogenous	E	E	E	0	−2798.505	10	1.2729	5661.779	5630.029	< 0.001	< 0.001	0.767	110
Heterogeneous	E	*	*	0	−2793.515	12	1.1903	5664.753	5626.653	< 0.001	< 0.001	0.648	150
3 classes													
Homogenous	E	E	E	0	−2785.883	13	1.30	5655.968	5614.693	= 0.085	< 0.000	0.699	26
Heterogeneous	E	*	*	0	−2773.122	17	0.96	5656.353	5602.378	< 0.001	< 0.000	0.477	99
Ψ full													
2 classes													
Homogenous	E	E	E	E	−2797.138	11	1.25	5665.523	5630.599	< 0.001	< 0.001	.770	113
Improper	E	*	*	*	−2775.621	14	1.06	5641.919	5597.469	< 0.001	< 0.001	.452	282
3 classes													
Improper	E	E	E	E	−2785.191	14	1.27	5661.059	5616.609	ns	ns	0.708	23
Improper	E	*	*	*	−2761.917	20	1.05	5653.374	5589.874	ns	ns	0.593	12

Note. Θ_k = residual covariance matrix, ψ_{11} = intercept variance, ψ_{22} = slope variance, ψ_{12} = intercept − slope covariance, *LL* = model log likelihood, #fp = number of free parameters, *SF* = scaling factor, *BIC* = Schwarz's Bayesian Information Criterion, *ABIC* = Sample-size adjusted *BIC*, *VLRT* = Vuong-Lo-Mendell-Rubin likelihood ratio test, *BLRT* = bootstrap likelihood ration test, N_{min} = size of the smallest latent class, E = fixed to be equal across latent classes, * = free to vary across latent classes, *Improper* = improper solution: either fail to converge or negative variance.

Table 2
Characteristics of latent classes for two class solution. Intercepts and slopes of SWB.

	Intercept mean	Intercept variance	Slope mean	Slope variance	Classification of individuals	Proportion of individuals
Class 1	0.83	1.68	−0.21	0.49	540	0.83
Class 2	−3.56			0.94	110	0.17

Note. Covariance between intercept and slope fixed at zero; intercept variance and slope variance constrained to be equal across the latent classes. All parameters are significantly different from zero at $p < 0.01$.

singly (univariate columns), and we can see that all except gender are significant predictors of class membership. Those in Class 1, whose well-being initially was high but whose well-being declined over time, tended to be older, to have a higher income, to be better educated, and to be more likely to be in a professional occupation. They were also less likely to subscribe to materialistic values. When all covariates are simultaneously entered into the model (the multivariate analysis), three emerge as significant independent predictors of class membership − income, education, and materialistic values.

Table 4 gives descriptive statistics on the covariates for each class.

Table 3
Predictors of class membership.

Variable	Univariate Analyses Coeff.	Multivariate Analyses Coeff.
Gender (female)	−0.311	−0.128
Age (older)	0.044[**]	0.004
Income (high)	0.373[**]	0.361[**]
Education (degree)	0.940[**]	0.732[*]
Occupation (professional)	0.973[**]	−0.289
MVS (materialist)	−0.497[**]	−0.451[**]
Intercept		−0.299

Note. Class 2 is the reference category for the logistic regression models.
* $p < 0.05$.
** $p < 0.01$.

Class 2, whose SWB improves over time, is a relatively poorer, more materialistic and less well educated section of the population, lending support to the status anxiety hypothesis.
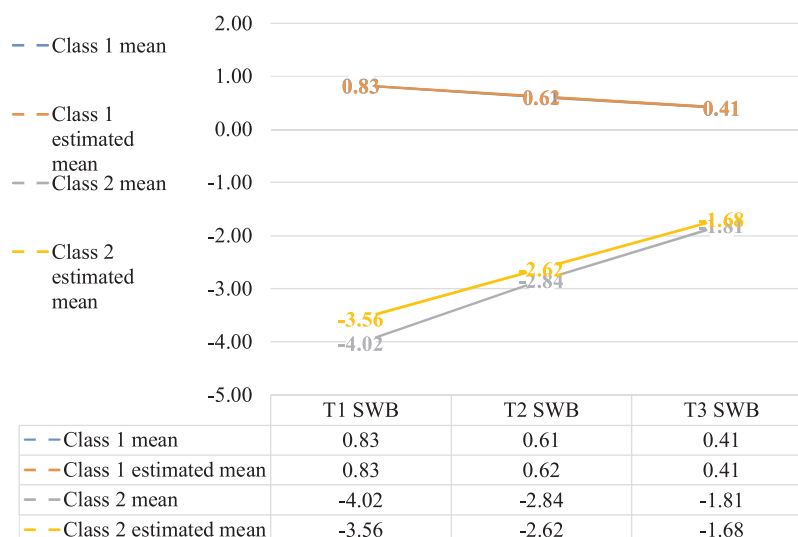

	T1 SWB	T2 SWB	T3 SWB
– –Class 1 mean	0.83	0.61	0.41
– –Class 1 estimated mean	0.83	0.62	0.41
– –Class 2 mean	-4.02	-2.84	-1.81
– –Class 2 estimated mean	-3.56	-2.62	-1.68

Fig. 2. Mean and estimated mean growth trajectories for latent classes.

Table 4
Characteristics of latent classes (Class 1: n = 540, Class 2: n = 110).

Variable	Class	
Income	1	Mean = 8.75 (ISK 575k) (SD = 4.08)
	2	Mean = 6.43 (ISK 343k) (SD = 2.76)
Age at time 1	1	Mean = 38.73 (SD = 10.44)
	2	Mean = 35.25 (SD = 9.48)
Gender	1	% Female = 77%
	2	% Female = 80%
Education	1	% Degree = 65%
	2	% Degree = 46%
Occupation	1	% Professional = 57%
	2	% Professional = 37%
Materialist Values (MVS)	1	Mean = 2.97 (SD = 0.97)
	2	Mean = 3.37 (SD = 1.02)

3.4. Simultaneous changes for each latent class

3.4.1. Statistical analysis

As well as looking at predictors of class membership, we also examined whether class membership was associated with other changes in psychological well-being, specifically changes in self-esteem, self-discrepancies and stress and anxiety. In order to see whether each class was changing on these variables as well as changing in SWB, we fitted a linear growth model to each variable on the full sample and saved the intercept and slope of the growth factors as factor scores. We then used the growth factors as predictors of class membership using the three-step method.

3.4.2. Results

Table 5 shows that class membership is associated with both initial stress and anxiety and change in stress and anxiety, but there are no relationships with initial self-esteem or change in self-esteem, or with initial self-discrepancies or change in self-discrepancies. Those in class 2 initially are higher in stress and anxiety, but over time their stress and anxiety increase at a lower rate than for those in class 1.

4. Discussion

The aim of the present study was to take advantage of unique socio-economic changes in Iceland to explore shifts in Subjective Well-Being (SWB) in a sample of Icelanders. Using GMM, we identified two groups with differing trajectories of SWB over a three year period. Group membership was predicted by occupation, education, income and, importantly, materialistic value orientation.

The first group in our data is much larger, perhaps a reflection of the middle class bias of our sample. These are individuals who are relatively well off, well-educated and more likely to be in professional occupations. In general, they have high self-esteem and do not experience undue stress and anxiety and are not particularly materialistic. For this group, SWB declines somewhat.

Table 5
Comparing classes on growth factor scores using Mplus Auxiliary (e).

Variable	Univariate Analysis Coeff.		Multivariate Analysis Coeff.	
	Intercept	Slope	Intercept	Slope
Self-esteem	0.121	0.064	0.142	−0.183
Self-discrepancy	−0.081	−2.758	0.185	−6.230
Stress/anxiety	−0.748[*]	3.285[+]	−0.813[*]	4.455[*]

Note. Class 2 is the reference category for the logistic regression models.
　[+] $p < 0.10$.
　[*] $p < 0.05$.

The second group we identified is not as well off. They tend to be less well educated and not in professional occupations. They have poorer self-esteem and experience more stress and anxiety at all time-points measured. This group also has higher levels of materialism. For this group, SWB *improves* over the measured period. These findings lend credibility to the weak and status anxiety versions of the IIH (Delhey et al., 2017; Layte, 2012, Layte & Whelan, 2014; Lynch et al., 2004; Mellor & Milyo, 2002; Wilkinson, 1999; Wilkinson & Pickett, 2017).

This diminishing gap in the subjective well-being of our two groups coincides with a diminished gap in income differences in post-crash Iceland and rhyme with Oishi et al.'s (2011) results that happiness of low income groups is higher during periods of low income inequality. As has been explained, the period studied was characterized by a strong decrease in income inequality and a decrease in perceptions of class division and we believe that this backdrop contributed to the SWB of people in our sample. Although findings are consistent with the weak and status anxiety versions of the IHH, our data and research method cannot provide a direct test between an increase in SWB and a decrease in income inequality. We can therefore only infer this association. We support our inference by reference to three other studies, all of which used adolescent census data. First, a recent study shows that community level income inequality harmed the well-being of deprived adolescents during high inequality during the height of the economic boom, but not in 2014, in the aftermath of the crash (Vilhjalmsdottir et al., 2018). Second, at more or less exactly the same time as inequality measures were rising (Ólafsson & Kristjánsson, 2013, 2017), adolescent psychological well-being deteriorated (Sigfusdottir, Asgeirsdottir, Sigurdsson, & Gudjonsson, 2008). And finally, Gudmundsdottir et al. (2015) showed that adolescents' self-reported happiness levels increased immediately after the sharp drop in income inequality.

Although the jury is still out, there is reason to suspect that certain subgroups are particularly responsive to income inequality and other external social phenomena (Schneider, 2016). Leading scholars have pointed out the need to address the specificity of the association between income inequality and the proposed outcomes (Kawachi & Subramanian, 2014). Few psychologists have intervened in this debate resulting in the lack of research on psychological mechanisms. Wilkinson & Pickett (2017) have recently called for psychological research and insight into how social evaluative threat, status differences and prejudice towards people in lower levels of the social hierarchy affect well-being. They also mention in particular the possible role of materialism and status-consumption in the association between inequality and well-being, citing qualitative research on how materialism affects well-being of children in unequal societies (Ipsos-Mori & Nairn, 2011). We agree and suspect that materialism and other consumer culture values are key elements in understanding how inequality may affect individuals, as suggested by our findings.

In the introduction we outlined how materialistic values inspire status comparison which then can translate into status anxiety when income differences are large. When economic hierarchies level off, the upward social-comparison is no longer as pressing and therefore less likely to translate into social evaluative stress. In our study, we observed that the lower-status group whose SWB improves over time was more materialistically oriented than the other group at initial standing. This adds further support to our suspicion that a reduction in social evaluative threat, or status anxiety, resulting from increased equality, contributed to the differences in SWB trajectories of our groups.

These shifts in income inequality must not be seen as mere measures without context. The period rising up to the crash in Iceland was characterized by rising affluence, fueled by the ascendancy of neoliberalism in policy. The levels of consumption of the banking elite reached such extremes, that the general public witnessed the "business Vikings" commuting to work on private jets, vacationing on private yachts, purchasing football clubs and hiring international superstars to entertain at private birthday parties (see e.g. Bergmann, 2014), just to name a few examples. This not only separated the rich from the rest, but

planted novel ways of experiencing inadequacy in terms of material possessions. The increased awareness of class division may have elicited status-related comparison and worries that were later reduced as the income distribution returned to its customary low levels. After the initial post-crash shock and anger, there was a slight sense of relief, of regained normalcy in terms of social stratification. Once the ultra-rich and their conspicuous, *nouveau-riche* consumption were no longer in the limelight (Oddsson, 2016), perceptions of class division subsided, despite increased economic hardship (Oddsson, 2017).

Although it is implied in the status anxiety mechanism that people engage in social comparisons of material possessions, a materialistic orientation has not been studied as a possible mediator between income inequality and well-being, as far as we know. In their meta-analysis on the relationship between materialism and SWB, Dittmar et al. (2014) did test an alternative association; whether income inequality mediated the association between materialism and SWB, but found no mediating effect. That is not to say there is no interrelation between materialism, income inequality and SWB. The data used in the meta-analysis was from different points in time and from a varied selection of countries, some of which are egalitarian and others where inhabitants are used to large class and income differences. This could potentially impact the results since it has been shown that characteristics of a nation can impact how income inequality affects people's well-being (Rözer & Krayykamp, 2013).

4.1. Limitations

As we acknowledge in our method section, our sample is not representative of the Icelandic population and therefore our findings should be interpreted with care and only with regards to our sample. Women and university educated people were overrepresented in our sample. As is inherent in convenience samples, such as this, it is impossible to interpret what effect that could have on the results. We suspect that if our sample had included a larger number of less educated non-professionals, this would have led to similar results, but with a larger low-status group, evening out the number of respondents in the two groups. Such speculations remain hypothetical and in order to test those speculations future research needs to take this shortcoming into account and apply the same GMM method to generalizable data.

Of course, there are numerous non-observed macro characteristics that co-occurred along with the shifts in income inequality in Iceland in the era under study that may explain our findings. Some of those characteristics might be consequences of inequality and others simply parallel phenomena which also may impact well-being. We know that alongside, and probably because of, the shifts in income inequality, perceptions of class division in Iceland shifted (Oddsson, 2016, 2017). Other studies, on mass-protest during the recession, indicate that because of the shared adversity of the economic crisis, Icelanders may have experienced an increased sense of social cohesion and collective efficacy (Bernburg, 2015, 2016). Because the concentration of wealth and great income inequalities create increasingly polarized societies, they are likely to generate a number of social, political and health problems (Wilkinson & Pickett, 2009). Thus it is safe to argue that the impact inequality may have on individual well-being can never be isolated from other societal consequences of income inequality or parallel shifts in the political or social fabric. In all research inferring changes in micro outcomes from macro characteristics, care must be taken in interpretation since correlates of both the micro and macro phenomena complicate statistical analyses and make it difficult to disentangle associations (Layte & Whelan, 2014).

4.2. Conclusion and future directions

This study is the first to monitor shifts in SWB during a rare period of decline in income inequality. Unfortunately, the current rise of global wealth inequalities gives few opportunities to study the inverse

implication of IIH. The fact that the happiness gap between our groups is diminishing over time is worthy of discussion and further investigation, especially now that income inequality is again on the rise (e.g. OECD, 2016) and explanations for the persistence of well-being disparities in Nordic welfare societies remain elusive (Huijts & Eikemo, 2009; Mackenbach, 2012).

Our findings have implications both for policy and for research. Nations have different traditions or set-points of wealth distribution and class-division to which they are accustomed and disruptions of that status quo can be more telling of how income inequality relates to health and well-being, than a comparison between nations with not only different Gini's but also a number of other different characteristics (Chen & Gotway Crawford, 2012). Therefore, more longitudinal studies on how changes in income inequality are linked with changes in well-being over time, *within a country,* are needed. Within country studies avoid empirical problems arising in cross-country analysis when using incomparable country-specific data (Deaton, 2003), and may thus better suited to partition psychological process from structural confounders, thus identifying how changes in inequality are related to changes in well-being disparities between people of differing socio-economic status.

Future research on the association of inequality and well-being must take into account the values and ideals of consumer cultures in order to fully understand how status differences affect well-being of different socio-economic groups. If our speculations turn out to be supported by future research, growing levels of materialism along with growing income inequality might have worrying consequences for well-being.

References

Åberg Yngwe, M., Fritzell, J., Lundberg, O., Diderichsen, F., & Burström, B. (2003). Exploring relative deprivation: Is social comparison a mechanism in the relation between income and health? *Social Science & Medicine, 57*(8), 1463–1473.

Asparouhov, T., & Muthen, B. (2014). Auxiliary variables in mixture modeling: Three-step approaches using Mplus. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(3), 329–341. http://dx.doi.org/10.1080/10705511.2014.915181.

Avendano, M., & Hessel, P. (2015). The income inequality hypothesis rejected? *European Journal of Epidemiology, 30*(8), 595–598. http://dx.doi.org/10.1007/s10654-015-0084-8.

Bergmann, E. (2014). *Iceland and the international financial crisis: Boom, bust, and recovery.* New York: Palgrave Macmillan.

Bernburg, J. G., & Olafsdottir, S. (2012). Viðhorf Íslendinga til launaójafnaðar (Icelanders' attitudes to income inequality). In G. B. Eydal, & S. Ólafsson (Eds.). *Þróun íslensku velferðarinnar 1992 til 2008* (pp. 291–330). Reykjavik: Félagsvísindastofnun Háskóla Íslands.

Bernburg, J. G. (2015). Economic crisis and popular protest in Iceland, january 2009: The role of percieved economic loss and political attitudes in protest participation and support. *Mobilization: An International Quarterly, 20*(2), 231–252. http://dx.doi.org/10.17813/1086-671X-20-2-231.

Bernburg, J. G. (2016). *Economic crisis and mass protest: The pots and pans revolution in Iceland.* Routledge.

Brunner, E., & Marmot, M. (1999). Social organization, stress, and health. In M. Marmot, & R. G. Wilkinson (Eds.). *Social determinants of health* (pp. 6–30). Oxford, United Kingdom: Oxford University Press.

Chaplin, L. N., Hill, R. P., & John, D. R. (2014). Poverty and materialism: A look at impoverished versus affluent children. *Journal of Public Policy & Marketing, 33*(1), 78–92. http://dx.doi.org/10.1509/jppm.13.050.

Chen, Z., & Gotway Crawford, C. A. (2012). The role of geographic scale in testing the income inequality hypothesis as an explanation of health disparities. *Social Science & Medicine, 75*(6), 1022–1031. http://dx.doi.org/10.1016/j.socscimed.2012.04.032.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

Craig, P., Cooper, C., Gunnell, D., Haw, S., Lawson, K., Macintyre, S., ... Thompson, S. (2012). Using natural experiments to evaluate population health interventions: New Medical Research Council guidance. *Journal of Epidemiology & Community Health, 66*(12), 1182–1186. http://dx.doi.org/10.1136/jech-2011-200375.

Dahl, E., Ivar Elstad, J., Hofoss, D., & Martin-Mollard, M. (2006). For whom is income inequality most harmful? A multi-level analysis of income inequality and mortality in Norway. *Social Science & Medicine (1982), 63*(10), 2562–2574. http://dx.doi.org/10.1016/j.socscimed.2006.06.002.

DeBotton, A. (2004). *Status anxiety.* London: Penguin.

Deaton, A. (2003). Health, inequality, and economic development. *Journal of Economic Literature, 41*(1), 113–158. http://dx.doi.org/10.1257/002205103321544710.

Delhey, J., Schneickert, C., & Steckermeier, L. C. (2017). Sociocultural inequalities and status anxiety: Redirecting the spirit level theory. *International Journal of Comparative Sociology, 58*(3), 215–240. http://dx.doi.org/10.1177/0020715217713799.

Diallo, T. M. O., Morin, A. J. S., & Lu, H. (2016). Impact of misspecifications of the latent variance-covariance and residual matrices on the class enumeration accuracy of growth mixture models. *Structural Equation Modeling: A Multidisciplinary Journal, 23*(4), 507–531. http://dx.doi.org/10.1080/10705511.2016.1169188.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*, 71–75. http://dx.doi.org/10.1207/s15327752jpa4901_13.

Diener, E., Oishi, S., & Lucas, R. E. (2002). Subjective well-being: The science of happiness and life satisfaction. In C. R. Snyder, & S. J. Lopez (Eds.). *Handbook of positive psychology*. Oxford and New York: Oxford University Press.

Dittmar, H., Bond, R., Hurst, M., & Kasser, T. (2014). The relationship between materialism and personal well-being: A meta-analysis. *Journal of Personality and Social Psychology, 107*(5), 879–924. http://dx.doi.org/10.1037/a0037409.

Dittmar, H. (2008). *Consumer culture, identity, and well-being. european monographs in social psychology series.* Psychology Press, Taylor & Francis Group.

Eckersley, R. (2015). Beyond inequality: Acknowledging the complexity of social determinants of health. *Social Science & Medicine, 147*, 121–125. http://dx.doi.org/10.1016/j.socscimed.2015.10.052.

Elmes, D. G., Kantowitz, B. H., & Roediger, H. L., III (2006). *Research methods in psychology* (8th ed.). Pacific Grove: Brooks/Cole.

Enders, C. K., & Tofighi, D. (2008). The impact of misspecifying class-specific residual variances in growth mixture models. *Structural Equation Modeling, 15*, 75–95. http://dx.doi.org/10.1080/10705510701758281.

Enders, C. K. (2010). *Applied missing data analysis.* New York: Guilford Press.

Garðarsdóttir, R. B., & Dittmar, H. (2012). The relationship of materialism to debt and financial well-being: The case of Iceland's perceived prosperity. *Journal of Economic Psychology, 33*(3), 471–481. http://dx.doi.org/10.1016/j.joep.2011.12.008.

Garðarsdóttir, R. B. (2006). *Materialism, money-making motives and income as influences on subjective well-being in the UK and in Iceland (Unpublished doctoral thesis).* Brighton, England: University of Sussex.

Goldberg, D. (1972). *The detection of psychiatric illness by questionnaire.* London: Oxford. University Press.

Grimm, K. J., Ram, N., & Estabrook, R. (2017). *Growth modeling: Structural equation and multilevel modeling approaches.* New York: Guilford Press.

Guðnadóttir, R. G., & Garðarsdóttir, R. B. (2013). Predictive validity of the self-discrepancy scale and the association between self-discrepancy and well-being. *Sálfræðiritið, 18*, 43–58.

Gudmundsdottir, D. G., Ásgeirsdóttir, B. B., Huppert, F. A., Sigfúsdóttir, I. D., Valdimarsdóttir, U. A., & Hauksdóttir, A. (2015). How does the economic crisis influence adolescents' happiness? Population-based surveys in Iceland in 2000–2010. *Journal of Happiness Studies,* 1–16. http://dx.doi.org/10.1007/s10902-015-9639-3.

Henriksson, G., Weitoft, G. R., & Allebeck, P. (2010). Associations between income inequality at municipality level and health depend on context – a multilevel analysis on myocardial infarction in Sweden. *Social Science & Medicine, 71*(6), 1141–1149. http://dx.doi.org/10.1016/j.socscimed.2010.05.044.

Huijts, T., & Eikemo, T. A. (2009). Causality, social selectivity or artefacts? Why socioeconomic inequalities in health are not smallest in the Nordic countries. *European Journal of Public Health, 19*(5), 452–453. http://dx.doi.org/10.1093/eurpub/ckp103.

International Labour Office (1990). *International standard classification of occupations, ISCO-88.* Geneva: International labour office. [Retrieved from] http://www.ilo.org/public/english/bureau/stat/isco/.

Ipsos-Mori, & Nairn, A. (2011). *Children's well-being in UK, Sweden and Spain: The role of inequality and materialism.* London, UK: Unicef.

Johnsen, G. (2014). *Bringing down the banking system: Lessons from Iceland.* New York: Palgrave Macmillan.

Kawachi, I., & Berkman, L. (2000). Social cohesion, social capital and health. In L. F. Berkman, & I. Kawachi (Eds.). *Social epidemiology* (pp. 174–190). Oxford, United Kingdom: Oxford University Press.

Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health, 78*(3), 458–467. [Retrieved from] http://www.ncbi.nlm.nih.gov/pubmed/14759673.

Kawachi, I., & Subramanian, S. V. (2014). Income inequality. In L. F. Berkman, I. Kawachi, & M. M. Glymor (Eds.). *Social epidemiology* (pp. 126–152). (2nd ed.). Oxford: Oxford University Press.

Ladin, K., Daniels, N., & Kawachi, I. (2010). Exploring the relationship between absolute and relative position and late-life depression: Evidence from 10 European countries. *The Gerontologist, 50*(1), 48–59. http://dx.doi.org/10.1093/geront/gnp065.

Layte, R., & Whelan, C. T. (2014). Who feels inferior? A test of the status anxiety hypothesis of social inequalities in health. *European Sociological Review, 30*(4), 525–535. http://dx.doi.org/10.1093/esr/jcu057.

Layte, R. (2012). The association between income inequality and mental health: Testing status anxiety, social capital, and neo-materialist explanations. *European Sociological Review, 28*(4), 498–511.

Lee, M. A., & Kawachi, I. (2017). The company you keep: Is socializing with higher-status people bad for mental health? *Sociology of Health and Illness, 39*(7), 1206–1226. http://dx.doi.org/10.1111/1467-9566.12580.

Lo, Y. T., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika, 88*, 767–778. http://dx.doi.org/10.1093/biomet/88.3.767.

Lynch, J. W., Smith, G. D., Harper, S., Hillemeier, M., Ross, N., Kaplan, G. A., & Wolfson, M. (2004). Is income inequality a determinant of population health? Part 1. A systematic review. *The Milbank Quarterly, 82*(1), 5–99. http://dx.doi.org/10.1111/j.0887-378X.2004.00302.x.

Mackenbach, J. P. (2012). The persistence of health inequalities in modern welfare states: The explanation of a paradox. *Social Science and Medicine, 75*(4), 761–769. http://dx.doi.org/10.1016/j.socscimed.2012.02.031.

Marmot, M. (2006). Status syndrome. *Journal of the American Medical Association, 296*(4), 369. http://dx.doi.org/10.1001/jama.296.4.396.

Mellor, J. M., & Milyo, J. (2002). Income inequality and individual health: Evidence from the current population survey. *Journal of Human Resources, 37*(3), 510–539.

Morin, A. J. S., Maiano, C., Nagengast, B., Marsh, H. W., Morizot, J., & Janosz, M. (2011). General growth mixture analysis of adolescents' developmental trajectories of anxiety: The impact of untested invariance assumptions on substantive interpretations. *Structural Equation Modeling, 18*, 613–648. http://dx.doi.org/10.1080/10705511.2011.607714.

Muthén, B., & Asparouhov, T. (2009). Growth mixture modeling: Analysis with non-Gaussian random effects. In G. Fitzmaurice, M. Davidian, G. Verbeke, & G. Molenberghs (Eds.). *Longitudinal data analysis* (pp. 143–165). Boca Raton: Chapman & Hall/CRC Press.

Muthén, L. K., Muthén, B. O., (1998-2017). Mplus User's Guide. Eighth Edition. Los Angeles, CA: Muthén & Muthén.

Muthén, B., & Shedden, K. (1999). Finite mixture modeling with mixture outcomes using the EM algorithm. *Biometrics, 55*, 463–469. http://dx.doi.org/10.1111/j.0006-341X.1999.00463.x.

Muthén, B. (2004). Latent variable analysis: Growth mixture modeling and related techniques for longitudinal data. In D. Kaplan (Ed.). *Handbook of quantitative methodology for the social sciences* (pp. 345–368). Newbury Park, CA: Sage.

Nagin, D. S. (2005). *Group-based modelling of development.* Cambridge, MA: Harvard University Press.

OECD (2016). *Inequality update-November 2016.* [http://www.oecd.org/social/OECD2016-Income-Inequality-Update.pdf. Accessed 19 December 2017].

Oddsson, G. (2016). Neoliberal globalization and heightened perceptions of class division in Iceland. *The Sociological Quarterly [Internet], 2016*(57), 462–490. http://dx.doi.org/10.1111/tsq.12143.

Oddsson, G. (2017). Class imagery and subjective social location during Iceland's economic crisis, 2008–2010. *Sociological Focus, 51*(1), 1–17. http://dx.doi.org/10.1080/00380237.2017.1341251.

Oishi, S., Kesebir, S., & Diener, E. (2011). Income inequality and happiness. *Psychological Science: A Journal of the American Psychological Society/APS, 22*(9), 1095–1100. http://dx.doi.org/10.1177/0956797611417262.

Ólafsson, S., & Kristjánsson, S. (2013). Income inequality in boom and bust: A tale from Iceland's bubble economy. In J. C. Gornick, & M. Jantti (Eds.). *Income inequality: Economic disparities and the middle class in affluent countries.* Palo Alto: Stanford University Press.

Ólafsson, S., & Kristjánsson, S. (2017). *Ójöfnuður á Íslandi.* Reykjavík: Háskólaútgáfan.

Petras, H., & Masyn, K. (2010). General growth mixture analysis with antecedents and consequences of change. In A. R. Piquero, & D. Weisburd (Eds.). *Handbook of quantitative criminology* (pp. 69–100). New York, NY: Springer.

Prag, P., Mills, M., & Wittek, R. (2013). Income and income inequality as social determinants ofhealth: Do social comparisons play a role? *European Sociological Review, 30*(2), 218–229. http://dx.doi.org/10.1093/esr/jct035.

Rözer, J., & Krayykamp, G. (2013). Income inequality and subjective well-being: A cross-national study on the conditional effects of individual and national characteristics. *Social Indicators Research, 113*, 1009–1023. http://dx.doi.org/10.1007/s11205-012-0124-7.

Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology, 25*, 111–163. http://dx.doi.org/10.2307/271063.

Rambotti, S. (2015). Recalibrating the spirit level: An analysis of the interaction of income inequality and poverty and its effect on health. *Social Science & Medicine, 139*, 123–131. http://dx.doi.org/10.1016/j.socscimed.2015.02.026.

Richins, M. (2004). The material values scale: Measurement properties and development of a short form. *Journal of Consumer Research, 31*, 209–219. http://dx.doi.org/10.1086/383436.

Roberts, J. A., & Clement, A. (2007). Materialism and satisfaction with over-all quality of life and eight life domains. *Social Indicators Research, 82*, 79–92. http://dx.doi.org/10.1007/s11205-006-9015-0.

Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg self-esteem scale. *Personality and Social Psychology Bulletin, 27*(2), 151–161. http://dx.doi.org/10.1177/0146167201272002.

Schneider, S. M. (2016). Income inequality and subjective well-being: Trends, challenges, and research directions. *Journal of Happiness Studies, 17*, 1719–17739. http://dx.doi.org/10.1007/s10902-015-9655-3.

Schwarz, G. (1978). Estimating the dimension of a model. *The Annals of Statistics, 6*(2), 461–464. http://dx.doi.org/10.2307/2958889.

Sigfusdottir, I. D., Asgeirsdottir, B. B., Sigurdsson, J. F., & Gudjonsson, G. H. (2008). Trends in depressive symptoms, anxiety symptoms and visits to healthcare specialists: A national study among Icelandic adolescents. *Scandinavian Journal of Public Health, 36*(4), 361–368.

Standardized; World Income Inequality Database. Retrieved on 23th of November 2016, from http://myweb.uiowa.edu/fsolt/swiid/swiid.html.

Statistics Iceland (n.d.-a). Retrieved from http://www.statice.is/statistics/society/education/educational-attainment/.

Statistics Iceland (n.d.-b). Retrieved on December 19th 2017 from http://px.hagstofa.is/pxen/pxweb/en/Samfelag/Samfelag_vinnumarkadur_3_arstolur/VIN01100.px/table/tableViewLayout1/?rxid=8b47bacc-9ed2-4d9a-983a-3e6aba128f64.

Subramanyam, M., Kawachi, I., Berkman, L., & Subramanian, S. V. (2009). Relative deprivation in income and self-rated health in the United States. *Social Science & Medicine (1982), 69*(3), 327–334. http://dx.doi.org/10.1016/j.socscimed.2009.06.008.

Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior, 52*(2), 145–161.

Vermunt, J. K. (2010). Latent class modeling with covariates: Two improved three-step approaches. *Political Analysis, 18*(4), 450–469. http://dx.doi.org/10.1093/pan/mpq025.

Vilhjalmsdottir, A., Bernburg, J. G., Gardarsdottir, R. B., & Sigfusdottir, I. D. (2018). Community income inequality and adolescent emotional problems: A population-based study. *Journal of Community Psychology.* http://dx.doi.org/10.1002/jcop.21968.

Vuong, Q. H. (1989). Likelihood ratio tests for model selection and non-nested hypotheses. *Econometrica, 57*, 307–333. http://dx.doi.org/10.2307/1912557.

Watson, D., Clark, L., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070. http://dx.doi.org/10.1037/0022-3514.54.6.1063.

Wickrama, K. A. S., Lee, T. K., O'Neal, C. W., & Lorenz, F. O. (2016). *Higher-order growth curves and mixture modeling with Mplus: A practical guide.* New York: Routledge.

Wilkinson, R. G., & Pickett, K. E. (2006). Income inequality and population health: A review and explanation of the evidence. *Social Science & Medicine, 62*, 1768–1784. http://dx.doi.org/10.1016/j.socscimed.2005.08.036.

Wilkinson, R. G., & Pickett, K. E. (2007). The problems of relative deprivation: Why some societies do better than others. *Social Science & Medicine (1982), 65*(9), 1965–1978. http://dx.doi.org/10.1016/j.socscimed.2007.05.041.

Wilkinson, R. G., & Pickett, K. (2009). *The spirit level: Why equality is better for everyone.* London: Penguin Books.

Wilkinson, R. G., & Pickett, K. E. (2017). The enemy between us: The psychological and social costs of inequality. *European Journal of Social Psychology, 47*(1), 11–24. http://dx.doi.org/10.1002/ejsp.2275.

Wilkinson, R. G. (1999). Health, hierarchy: And social anxiety. *Annals of the New York Academy of Sciences,* 48–63 [877231].