Looking back in order to predict the future: Relative resource assessments and their relationship to future expectations

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Abstract

In this research, we investigated how relative resource assessments relate to future expectations. In previous research, resources are typically studied separately, and contextual influences and reference-point dependencies are often ignored. We addressed this in an online survey in which Icelanders (N = 611) assessed their economic, temporal, social, and emotional resources using four reference points (wants, others, past, future). We used exploratory factor analysis to reduce the four resources into three reliable factors: economic, temporal, and socio-emotional resources. Using hierarchical regression we found that assessments of socio-emotional and economic resources were related to future expectations, even after controlling for more objective resource markers, such as income and education. This relationship was strongest when past resources were used as the reference point for assessing current resources. We interpret these findings as suggesting that temporal comparisons to the past become more salient during times of instability, as Icelanders have recently gone through much economic and political turmoil. A psychological challenge for individuals recovering from economic collapse is to abstain from comparing current with past resource levels, as it elicits a loss experience. Overcoming a feeling that “it was better before” seems vital in re-establishing optimistic future expectations.

Keywords: relative resource assessments, reference points, temporal relative deprivation, future expectations, optimism, worry

It is well established that economic resources are positively related to well-being and positive future expectations (Diener & Biswas-Diener, 2002). Possessing a large resource reservoir makes individuals less vulnerable and facilitates the attainment of more resources (Hobfoll, 2002). Individuals who have enough resources therefore have good grounds for viewing the future brightly, as they can rest secure in the knowledge that they will most likely be able to face life’s adversities. In contrast, people who feel that their resources are lacking may be worried about the future, as this exposes them to vulnerabilities ensued by negative events. But, how do you know if your current standing gives you cause for concern or optimism? Perhaps a subjective assessment of the available resources is as important as your objective resource levels! When making such an
assessment you are likely to evaluate your current standing relative to a reference known to you, using some type of reference point for the assessment.

The following scenario illustrates this assessment process: Imagine that you were able to save €1600 two years ago, and €1000 last year, but only €400 this year. Although you now have the nice sum of €3000 in your bank account you may sense a resource threat and feel pessimistic and worried about the future when you realize that your monthly savings are decreasing. If you learn that a friend has been able to increase his savings from €400 two years ago, €900 last year, to €1400 this year, your future would perhaps seem even worse in comparison, especially since his savings appear to be increasing while yours keep decreasing. Although your total savings are larger, you may in fact be less happy with the €3000 in your account than he is with the €2700 in his. Put differently, the positive actual value of your savings may obtain negative assessed value following your comparative evaluation, which in turn influences your future expectations. This assessment involves reference points such as previous outcomes (historical comparisons), expected outcomes (future oriented comparisons) and other peoples outcomes (social comparisons). Previous research has generally said little about the implications of deprivations stemming from different sources. This research studies the relationship between relative resource assessments and future outlook. We ask whether differences in individual’s future outlook may depend on experiencing scarcity or abundance of personal resources relative to the past, to the future, to your wants or to the resources of others.

What is being assessed?

Resources are not limited to the monetary or material domain. In daily life, many kinds of personal resources influence our attitudes and behaviours. Even though resources may differ in shape, size and type, they also overlap. Social resources may both affect and be affected by economic resources. For example, people with good networking opportunities may gain access to financial capital through their social relationships. Similarly, social relationships can help buffer the financial strain of job loss by friends chipping in to help with the bills. Due to such interconnections, it is unwise to examine one resource at a time, as information about nearby buffering or hindering resources may be lost (Hobfoll, 2002).

However, very little empirical research systematically translates theories on personal resources into an agreed-upon measurement instrument. The relationship between resources is often overlooked, and only one type of resource is usually measured at a time. Some attempts have been made to develop measurement instruments within an integrated resource framework (Foa & Bosman, 1979; Fulton-Picot, Youngblut, & Zeller, 1997; Nuckolls, Cassel, & Kaplan, 1972). Yet these instruments are seldom used since they have displayed low internal consistency within resource types (Stangl, 1993) or are highly context-specific (e.g. scales that measure resources used during pregnancy and resources used by caregivers; Fulton-Picot et al., 1997; Nuckolls et al., 1972). Moreover, since different conceptualizations and traditions are commonly used to measure each resource, it becomes difficult to separate the effects of the various methods used, from the inherent differences between resource types. Finally, although personal resource assessments are likely to be relative, this is seldom an integral part of how they are measured.

We address this in the present research by including in our study not only assessments of economic resources but also of social, emotional, and temporal resources. By focusing on these cen-
tral resources simultaneously, we address the need for a more broad and integrative look at how combinations of resources future expectations (Hobfoll, 2002).

How is it being assessed?

There is seldom any objective metric available to determine whether an individual has too little, just enough, or an abundance of personal resources. Even in the presence of objective information, using heuristics such as reference points to decipher how much you have, requires less cognitive effort than more rigorous resource assessments. Therefore, people are likely to rely on heuristics in day to day life instead of more mentally taxing methods (Gigerenzer, Todd, & ABC Research Group, 1999). The idea that individuals use relative information to prescribe value is strongly supported by both theoretical predictions and empirical evidence (Festinger, 1954; Smith, Pettigrew, Pippin, & Bialosiewicz, 2012; Tversky & Kahneman, 1981, 1986). Contextual factors, such as anchoring an evaluation on a reference point, seem to have predictable and robust effects on how people assess value (Kahneman & Tversky, 1979, 1984; Shaﬁr, Simonson, & Tversky, 1993; Thaler, 1985, 1999).

Although we can state with certainty that human evaluation is often relative, a major challenge remains of specifying the relevant referents for such assessments. Emphasizing this point, the results from a meta-analysis of relative deprivation research indicate that the strength of the link between relative assessments and relevant outcome variables depends on whether the reference point used for the assessment is clearly specified by the researcher (Smith et al., 2012). Too often it seems, researchers studying relative deprivation do not clearly specify relative to what an individual feels deprived. In this research, we address Smith and colleagues’ (2012) challenge to clearly state which reference point respondents should compare to, and measure multiple reference points simultaneously to study the relative importance of each reference point.

Several types of comparisons points have been suggested to yield the strongest responses to relative resources assessments. One line of research argues that it is primarily discrepancies between current and desired resources that evoke emotional reactions. According to one of the earlier surveys on the correlates of resentment in the workplace and at home, wanting and entitlement were seen as the only two preconditions necessary for relative deprivation to occur (Crosby, 1976). Since then, many studies have found a link between having less than desired and dissatisfaction (Fallacaro & Yw, 1997; Freudenthaler & Mikula, 1998; Sweeney, McFarlin, & Inderrieden, 1990).

Others have suggested that social comparisons are the primary reference point for relative judgements (e.g. Suls & Wheeber, 2013). Early on, Social Comparison Theory (Festinger, 1954) postulated that, in the absence of objective standards, people compare their opinions and abilities to similar others. A meta-analysis on relative deprivation research concluded that there was a clear association between negative social comparisons and resentment (Smith et al., 2012). It has also been shown that feelings of being socially deprived can be especially salient during periods of dramatic societal change (de la Sablonnière, Tougas, & Perenlei, 2009).

Finally, prospect theory assumes that when explicit reference points are missing, people use the resource level to which they have become accustomed to in order to evaluate losses and gains (Kahneman & Tversky, 1979). Similarly, Temporal Comparison Theory (Albert, 1977) has emphasized the central role of comparisons to both the past and the future. According to the theory, in times of rapid change the present is unstable, unfamiliar and unique. Since the present
does not serve as a reliable anchor for evaluation during uncertain periods, using temporal comparison may be more helpful. In line with these theoretical predictions, previous research shows that well-being is related to temporal comparisons to the past and the future, in societies going through dramatic social change (e.g. de la Sablonnière, Taylor, Perozzo, & Sadykova, 2009; de la Sablonnière, Tougas, & Lortie-Lussier, 2009; de la Sablonnière et al., 2015).

Relative resource assessments and future outlook

As mentioned, our personal resource reservoirs can be a cause for optimism or concern. Although related, optimism and worry are not mutually exclusive, and therefore the presence of one is not evidence for absence of the other. As Folkman and Moskowitz (2000) demonstrate, people may have both views simultaneously. Measuring both therefore gives a more complete picture of people's future outlook.

Most research on optimism has conceptualized it as a stable and heritable trait contributing to a wide array of positive outcome (e.g. Lucas, Diener, & Suh, 1996; Scheier & Carver, 1985). Although we do not dispute these findings, there is evidence that future expectations also vary in response to life circumstances (Heinonen, Räikkönen, & Keltikangas-Järvinen, 2005; Heinonen et al., 2006; Korkeila et al., 2004). For example, during the course of a year, optimism varies in response to work problems and relationship problems (Atienza, Stephens, & Townsend, 2004). Most likely, resources and future expectations have a reciprocal relationship, where optimistic expectations of the future help people gain resources by increasing sense of self-efficacy and leading persistent effort in the present (Carver, Scheier, & Segerstrom, 2010; Fredrickson, 2001) which, if people are successful in their quest, in return can increase optimism. Similar to optimism, some people have a predisposition for worrying about the future (Kotov, Gamez, Schmidt, & Watson, 2010). However, there is also evidence that worry co-varies with changes in resource levels (Lee & Dunkle, 2010). We propose that expectations of the future are at least in part based on resource assessments.

Previous research has mostly focused on how fluctuations of objectively measurable resources, such as income and education, influence optimism and worries. This is interesting, given that one of the most influential emotion theories in psychology highlights the role of appraisals for determining our emotional responses (e.g. Lazarus & Folkman, 1984). More specifically, according to appraisal theory, an emotion is a response to an evaluation of how a particular circumstance will influence personal well-being, in relation to an evaluation of the available resources to cope with the situation (Roseman & Smith, 2001; Smith & Lazarus, 1990). Despite clear emphasis of an evaluative process, this is seldom explicitly included in empirical studies of the relationship between resources and emotions.

Aims and expectations

The aim of this research has been threefold:

We aimed firstly to test whether relative resource assessments relate to expectations of the future and if each personal resource adds to this relationship? For that purpose, we asked people both about their worries and about their optimistic expectations of the future. In order to get a broad picture of their resource assessments we asked them to evaluate whether they sensed
scarcity, sufficiency, or abundance of economic, social, emotional and temporal resources. We formulated the following hypotheses based on our expectations:

H₁: Even after accounting for demographic variables, there is a positive and additive relationship between each personal resource and optimism.

H₂: Beyond the influence of demographic variables, there is a negative and additive relationship between each personal resource and worries.

We aimed secondly to examine if the assumed relationship between relative resource assessments and future expectations were influenced by the referent used for the evaluation. To this goal, we measured the relative impact of comparing one’s resources to wants, others, the past and the future. We queried, when controlling for the influence of different relative resource assessments, what is the additional effect of a particular reference point on the relationship between personal resources and future outlook? We tested empirically the following hypothesis:

H₃: Each reference point has an additive effect on the relationship between relative resources and future outlook.

As we were unable to find previously established appropriate measurement instruments, we created a set of items aimed at letting the participants assess economic, emotional, social and time resources with different reference points. To determine the reliability of these items we asked whether the items clustered into the four factors proposed? Our hypothesis being:

H₄: The items measuring personal resources will cluster into the following four factors: economic, emotional, social and time resources.

Methods

Participants

We emailed our survey to 994 Icelanders in March of 2013. Of the recipients, 611 (61.5%) participated in the survey. The survey was administered in Iceland under the authorization of the Internet Panel provided by the Social Science Research Institute (SSRI) of the University of Iceland. Based on the SSRI’s Internet Panel, a random sample of participants was drawn, aged 18 and older. The sample was stratified by gender, age, and residence so that the subject groups were proportional to the Icelandic population. The Internet Panel members were chosen from a random sample of people in the Icelandic National Register. The panel administrators decided when to cease data collection. We had access to the data once all data collection was completed.

Potential participants were given information about the purpose and scope of the research. They were guaranteed confidentiality, assured their participation was voluntary, and advised they could withdraw from the survey at any time. Participants gave their consent to these terms by clicking on a survey link.

Measurements and design

Independent variables

Relative resource assessments (RRA). The RRA items measured relative assessments of Icelanders personal resources. Resources were measured with 16 items focusing on economic, social, temporal and emotional resources. The participants were asked to assess their personal resources in comparison to a reference point. The following four reference points were...
The participants answered questions on a 7-point bipolar scale (−3 less and +3 more). In total, the participants answered $16 \times 4$ RRA. The following four items exemplify relative assessment for each proposed resource type, using one of the four comparison points:

- **Social resource:** “Compared to what I am used to, I feel that I have a smaller or larger social network than before”.
- **Emotional resource:** “Compared to what others who are important to me have, I feel that I have less or more emotional support”.
- **Economic resource:** “Compared to what I want to have, I feel I have less or more money”.
- **Time resources:** “Compared to what I think I will have in the future, I now have less or more time for interests and hobbies”.

We presented the resource assessment items randomly to avoid statistical clustering due to method variance. By presenting the items in one block per resource area (within which the items were paired with a particular reference point and then randomly ordered), it was simpler for the participants to complete the surveys. After this the survey had four resource blocks. Presentation order of the four blocks was random. See the Appendix for a full list of the RRA items and a chart of the survey flow.

The items were developed for the purpose of this study and constructed on the basis of two pilot studies (Pilot I, $N = 25$; Pilot II, $N = 132$). In the first pilot study, we asked open-ended questions about resources and the comparisons participants used when assessing their resource levels. In the second pilot study, we asked participants to rank a fixed number of resources and comparisons in order of importance. The combined results indicated that the four resources and the four comparisons above were the most important for the participants.

### Dependent variables

**Future expectations.** The participants expressed their degree of optimism towards the future using a 7-point bipolar scale (−3 dark and +3 bright). Further, we measured the participants’ worry about the future using a 7-point scale (0 not worried and 6 very worried).

**Background variables.** We used 10 standardized variables provided by the Internet Panel in Iceland as background variables (see Table 1).

### Results and discussion

**Sample**

In general, the Icelandic Internet Panel provided a representative sample of the Icelandic population (Table 1). The gender distribution was almost even; approximately half of participants were male. The mean age was 49 years. Most participants lived in the capital area. A majority of the participants were employed and had a secondary level education or higher. Almost half of the
participants were married. The participants had one child and 3 people living in the household on average. The average monthly income was around €2000 and the average household income was between €3500 and 4500 per month. On the whole, the sample was of high quality and resembled the Icelandic population.

Table 1. Descriptive summary.

|                      | n  | % of N | % Missing |
|----------------------|----|--------|-----------|
| Gender               |    |        |           |
| Male                 | 283| 46.3   | 0         |
| Female               | 328| 53.7   |           |
| Education            |    |        | 16.7      |
| First level          | 79 | 12.9   |           |
| Secondary level      | 190| 31.1   |           |
| Third level          | 240| 39.3   |           |
| Employment           |    |        | 22.1      |
| Other                | 3  | 0.5    |           |
| Disabled             | 24 | 3.9    |           |
| Unemployed           | 8  | 1.3    |           |
| Pensioner            | 43 | 7.0    |           |
| Student              | 30 | 4.9    |           |
| Employed             | 368| 60.2   |           |
| Residency            |    |        | 0         |
| Urban                | 384| 62.8   |           |
| Rural                | 227| 37.2   |           |
| Marital status       |    |        | 22.1      |
| Single               | 67 | 11.0   |           |
| Cohabiting           | 99 | 16.2   |           |
| Married              | 286| 46.8   |           |
| Divorced             | 17 | 2.8    |           |
| Widow/er             | 7  | 1.1    |           |
|                      | M  | SD     | % Missing |
| Age                  | 49.22| 16.57 | 0         |
| Income               | 3.43| 1.46  | 32.7      |
| Household income     | 4.18| 1.95  | 37.6      |
| No. in household     | 3.10| 1.37  | 21.3      |
| No. of children      | .98 | 1.15  | 29.6      |
| General resources    | 1.29| 1.37  | 10.5      |
| Future resources     | 1.26| 1.29  | 12.7      |
| Confidence in prediction | 1.14| 1.35  | 12.9      |

Coding scheme: Income in Euros per month: 1 = less than 1000, 2 = 1000–1500, 3 = 1500–2500, 4 = 2500–3500, 5 = 3500–4500, 6 = 4500–5500, 7 = 5500–6500, 8 = 6500 and over; Household income in euros per month: 1 = Less than 1500, 2 = 1500–2500, 3 = 2500–3500, 4 = 3500–4500, 5 = 4500–5500, 6 = 5500–6500, 7 = 6500–8500, 8 = 8500–10,000, 9 = More than 10,000 €; The original income alternatives were in Icelandic krona. The relationship between the euro and the krona has greatly fluctuated in recent years. The numbers above are based on a transfer made on 2014-09-16. Nr in household: 1_1 in household, 7_7 or more; Nr of children: 0_children, 6_6 or more children.
Missing data
We followed best practice recommendations for dealing with the missing data (19.5% of the values missing). The use of multiple imputations is better at reducing bias and increasing efficiency than more traditional methods of dealing with missing data such as listwise and pairwise deletion (Schafer & Graham, 2002). We used five multiple imputed values to replace each missing value. We determined these imputed values using a bootstrapping-based algorithm developed by Honaker, King, Blackwell, and others (2011) that is appropriate for large amounts of variables. The program uses all available information from the sample to impute the most probable missing values. This results in five data-sets with simulated values of plausible alternative versions of the complete data. Each of the five data-sets is then analysed. Finally, the results are combined. This procedure results in a superior estimation of both coefficients and standard errors that reflect the missing data uncertainty (See Schafer & Graham, 2002 for more details).

Exploratory factor analysis
EFA was used to evaluate the underlying resource structure of the 16 resource items. As the primary focus of this analysis was on the resource structure, we created index variables of each resource item assessed with the four reference points. We used a maximum likelihood procedure as the variables in the sample were generally normally distributed. We used oblique rotation to simplify the interpretation while allowing the factors to correlate. To determine the number of explanatory factors, we used a combination of the Kaiser criterion of eigenvalues > 1, reliability analysis, and examination of the scree plots.

Three distinct factors describe respondents’ resource assessments: economic, temporal and socio-emotional resources (Table 2). This can be seen as a partial support for H₄. The factors resembled our a priori assumption that the four resources (economic, social, temporal and emotional) would be extracted, although social resources and emotional resources did not emerge as separate factors. Instead, these two resources combined as a socio-emotional factor. The KMO score indicates good sampling adequacy (KMO = .92) and the three factors explain a large amount of the variance (79.17%).

Because of the distinct pattern in the rotated factor scores, identifying the three factors was straightforward. For example, the items designed to measure economic resources clearly loaded onto one factor with no overlap. Furthermore, the randomized presentation of the resource items ensured that the factor structure did not derive from the survey construction. The items loaded strongly onto the corresponding factor, with all loadings above .70.

We retained the three factors for several reasons. In following best practice recommendations, we took into account the results from the scree-plots, the Kaiser criterion of eigenvalues above 1, and reliability analysis (Costello & Osborne, 2005; Field, 2013). The scree-plots were somewhat ambiguous, with breaks in the line at both 3 and 5 factors. This suggested that 3 or 5 factors should be retained. The eigenvalues were above the recommended criterion of 1 for the 3 factors and well below for the 5 factors. All factors were highly reliable with Cronbach α ranging from .93 to .96. In sum, the different indicators generally supported our decision to retain three factors.

The missing data did not alter the general factor structure. We checked the influence of missing data on the factor structure by conducting separate EFAs for both the original sample and the five multiple imputed samples which did not qualitatively alter our conclusions, although two of the five samples suggested that emotional and social resources were separate factors. Therefore,
based on the factor structure, we created 12 index variables, one for each resource type evaluated with a specific reference point, for use in successive analyses.

Preparatory analysis

Before turning to the main analysis, we checked whether the relative resource assessments differ when participants used different reference point to evaluate their resource levels. As may be seen in Table 3 the relative resource assessments were interrelated, but not excessively overlapping. We used correlations over .70 as criteria for excessive overlapping, as correlations above .70 mean that more than 49% of the variance is shared. None of the correlations between the relative resource assessments were above .70. The average relationship between the relative resource assessments was of moderate strength and significant ($r = .49$).

Further, we studied whether there was a positive relationship between relative resource assessments and optimism, and a negative one to worries. For both economic resources and socio-emotional resources there was a weak to moderate relationship with future outlook (Table 3). The relationship was stronger when economic and socio-emotional resources were assessed.

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Table 2. Exploratory factor analysis (EFA, $N = 486$).

| Items | Rotated factor loadings |
|-------|-------------------------|
|       | Economic | Time | Socio-emotional |
| I feel that I have… | | | |
| …less or more income | .93 | -.11 | .08 |
| …less or more money | .98 | -.00 | .00 |
| …less or more savings | .82 | .14 | -.02 |
| …less or more money for spending | .96 | .03 | -.03 |
| …less or more time for interests and hobbies | .04 | .90 | .01 |
| …less or more time | -.01 | .99 | -.04 |
| …less or more time to relax | .04 | .91 | -.06 |
| …less or more time for others who are important to you | -.04 | .75 | .25 |
| …less or more emotional security | -.01 | -.01 | .87 |
| …less or more love | -.03 | .02 | .76 |
| …less or more emotional support | -.01 | .03 | .88 |
| …less or more trust | .08 | .02 | .80 |
| …a smaller or larger social network | -.00 | -.02 | .84 |
| …fewer or more close relationships | .10 | -.05 | .71 |
| …fewer or more friends | -.03 | .03 | .77 |
| …fewer or more acquaintances | -.03 | .02 | .72 |
| Eigenvalues | 8.18 | 2.46 | 2.02 |
| % of variance | 79.17 | 51.12 | 12.65 |
| Cronbach $\alpha$ | .96 | .95 | .93 |
| KMO | .92 |

Notes: Pattern matrix for an exploratory factor analysis. Extraction method was maximum likelihood with oblique rotation. Factor loadings > .70 are shown in bold. Number of factor extracted was based on Kaiser’s criterion of eigenvalues > 1. Scree plots also supported the extraction of 3 factors. The scree plots from the MI samples also indicated that 3 factors should be extracted, although 2 out of 5 samples had 4 factors with eigenvalues over 1.
Table 3. Correlations between resource variables and expectations.

|       | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Time  | Past  | −.46** | .47** | .67** | .41** | .29** | .27** | .23** | .33** | .19** | .23** | .19** | .22** | −.18** |
|       | Future| −.47** | .44** | .24** | .47** | .30** | .21** | .16** | .30** | .26** | .04   | −.00  | −.02  |       |
| 3     | Wants | −.49** | .15** | .29** | .60** | .27** | .13*  | .19** | .65** | .16** | .04   | −.05  |       |       |
| 4     | Others| −.24** | .30** | .32** | .42** | .16** | .16** | .25** | .27** | .12*  | −.12* |       |       |       |
| 5     | Soc-emo| Past | −.50** | .43** | .56** | .38** | .20** | .15** | .21** | .46** | −.32**|       |       |       |
| 6     | Future| −.49** | .46** | .25** | .49** | .24** | .16*  | .16** | −.09  |       |       |       |       |       |
| 7     | Wants | −.55** | .13** | .17** | .59** | .17** | .16** | −.17**|       |       |       |       |       |       |
| 8     | Others| −.20** | .16** | .22** | .36** | .32** | −.26**|       |       |       |       |       |       |       |
| 9     | Eco   | Past  | −.49** | .32** | .66** | .41** | −.35**|       |       |       |       |       |       |       |
| 10    | Future| −.31** | .43** | .19** | −.17**|       |       |       |       |       |       |       |       |       |
| 11    | Wants | −.37** | .15** | −.15**|       |       |       |       |       |       |       |       |       |       |
| 12    | Others| −.33** | −.32**|       |       |       |       |       |       |       |       |       |       |       |
| 13    | Optimistic expectations |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 14    | Worry |       |       |       |       |       |       |       |       |       |       |       |       |       |
| M     | .18   | .34   | .11   | .22   | .26   | .24   | .12   | .20   | −.43  | −.21  | −.37  | .18   | 1.36  | 2.43  |
| SD    | 1.26  | 1.18  | 1.41  | 1.24  | .98   | .83   | .99   | .95   | 1.49  | 1.49  | 1.73  | 1.44  | 1.45  | 1.48  |

Note: Pooled correlations for all MI samples. Resource assessments: −3_less, to +3_more; Optimism: −3_dark, to +3_bright. Worry: 0_not worry, 6_very worried. * < .05; ** < .01.
relative to the past and to others. This same pattern emerged for time resources, although the strength of the relationships was notably weaker.

Main analysis
We conducted two separate hierarchical OLS regressions, one for optimistic expectations and one for worry, including first background variables, such as income and marital status, and in a second step we added relatively assessed resources. To study how the relationship between resources and expectations varied depending on the assessment procedure, we separated the resources according to the comparison point used for the assessment.

First, we ask, does each personal resource add to the model that predicts future outlook? As may be seen in Table 4 the resources generally show a positive relationship with optimism, and a negative relationship to worries. The first model consisted of demographic variables and the second model added resources assessed with different reference points. When resource assessments were included the combined models explained considerable amounts of variance in both optimistic expectations \((R^2 = .41)\) and worry \((R^2 = .30)\). Holding all other variables constant, both economic resources and socio-emotional resources were significant predictors of more optimism and less worries. Time resources however did not significantly add to the model. We therefore gained partial support for \(H_1\) and \(H_2\).

More specifically, we ask, does each reference point used for the resource assessment have an additive effect in the model of the relationship between relative resources and future outlook? When controlling for demographic variables and the other relative assessments, economic and socio-emotional resources compared to the past contributed significantly in predicting the participants’ future outlook. The model showed that for each unstandardized unit increase in socio-emotional resources compared to the past, optimism increased by half a unit on a 7-point scale \((b_{\text{pooled}} = .50, SE_{\text{pooled}} = .09)\). Similarly, for each unit increase in present economic resources compared to the past, optimism increased by one fifth of a unit \((b_{\text{pooled}} = .17, SE_{\text{pooled}} = .07)\). The relationship between resource assessments and worry was similar, although not as strong. For each unstandardized unit increase in present socio-emotional resources compared to the past, worries decreased by one fourth of a unit on a 7 point scale \((b_{\text{pooled}} = −.26, SE_{\text{pooled}} = .12)\). Although this was the strongest resource assessment predictor of worries in the model, this effect was not statistically significant \((p = .052)\). For each unit increase in current economic resources compared to the past, participants tended to worry less by .15 units \((b_{\text{pooled}} = −.15, SE_{\text{pooled}} = .06)\). Unless otherwise stated, all the results mentioned above had \(p\) values below .05.

Additionally, an increase by one unit in socio-emotional resources compared to others was related to a decrease in worries by .18, controlling for all other variables in the model \((b_{\text{pooled}} = −.18, SE_{\text{pooled}} = .04)\). However, this was the only instance where comparing resources to others reached statistical significance, controlling for the other variables in the model. Resources compared to wants and the future were not additive predictors of future expectations. We therefore conclude that we gained partial support for \(H_3\).

As demographic variables can be seen as a proxy for objective resource levels, there were two reasons for their inclusion in the model. First, as resources tend to be interrelated, it is important to control for as many resources as possible. Second, we would in line with previous research (e.g. Carver & Scheier, 1999) suspect that the relationship between income and expectations is mediated through the relative assessment of economic resources. The results show that the demographic variables together explained a small but significant amount of variance in both optimism
Table 4. Hierarchical multiple regressions for future expectations.

| Models                                    | Optimistic expectations |  |  |  | Worry |  |  |  |
|-------------------------------------------|-------------------------|---|---|---|------|---|---|---|
|                                            | Pooled b    | Pooled SE | p  | Relative efficacy | Pooled b    | Pooled SE | p  | Relative efficacy |
| 1                                          |             |            |    |                   |             |            |    |                   |
| Intercept                                  | .397        | .503       | .441 | .902              | 2.521       | .414       | .000 | .937              |
| Gender                                     | −.066       | .152       | .668 | .930              | −.396       | .141       | .007 | .940              |
| Age                                        | .002        | .005       | .683 | .952              | −.001       | .004       | .750 | .963              |
| Second level compared to first level education | .286        | .199       | .157 | .943              | −.165       | .221       | .465 | .908              |
| Third level compared to first level education | .597        | .216       | .010 | .919              | −.317       | .193       | .108 | .937              |
| Other compared to employed                 | .307        | .643       | .635 | .950              | −.085       | .747       | .910 | .904              |
| Disabled compared to employed              | −.312       | .341       | .373 | .905              | .209        | .323       | .524 | .908              |
| Retired compared to employed               | −.135       | .433       | .756 | .953              | .536        | .527       | .326 | .897              |
| Unemployed compared to employed            | −.246       | .271       | .372 | .926              | −.378       | .326       | .269 | .885              |
| Student compared to employed               | .346        | .363       | .353 | .906              | −.082       | .326       | .802 | .921              |
| Cohabitng compared to single               | .460        | .225       | .041 | .976              | −.133       | .219       | .544 | .971              |
| Married compared to single                 | −.107       | .230       | .644 | .947              | .241        | .238       | .318 | .927              |
| Divorced compared to single                | .681        | .333       | .041 | .992              | −.354       | .375       | .351 | .938              |
| Widow/er compared to single                | −.567       | .462       | .222 | .966              | .352        | .616       | .579 | .889              |
| Residence                                  | −.029       | .127       | .820 | .993              | −.055       | .135       | .683 | .956              |
| Nr living in household                     | .008        | .102       | .942 | .877              | .005        | .079       | .955 | .908              |
| Nr of children                             | .005        | .100       | .960 | .898              | .025        | .092       | .789 | .906              |
| Income                                     | −.046       | .072       | .533 | .888              | .146        | .068       | .052 | .890              |
| Household income                           | .144        | .050       | .099 | .915              | −.137       | .056       | .028 | .890              |
| 2                                          |             |            |    |                   |             |            |    |                   |
| Intercept                                  | .514        | .517       | .344 | .879              | 2.295       | .380       | .000 | .940              |
| Gender                                     | −.073       | .142       | .615 | .912              | .409        | .118       | .001 | .970              |
| Age                                        | .005        | .004       | .259 | .935              | −.004       | .004       | .307 | .936              |
| Second level compared to first level education | .332        | .177       | .068 | .932              | −.207       | .199       | .311 | .909              |

(Continued)
| Models | Optimistic expectations | | | | Worry | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled b | Pooled SE b | p | Relative efficacy | Pooled b | Pooled SE b | p | Relative efficacy |
| Third level compared to first level education | .538 | .194 | .012 | .911 | −.295 | .183 | .117 | .930 |
| Other compared to employed | .088 | .557 | .876 | .947 | .044 | .649 | .947 | .913 |
| Disabled compared to employed | .057 | .251 | .822 | .946 | −.110 | .257 | .670 | .946 |
| Retired compared to employed | −.197 | .386 | .611 | .943 | .618 | .477 | .214 | .900 |
| Unemployed compared to employed | −.211 | .238 | .383 | .924 | −.377 | .273 | .186 | .900 |
| Student compared to employed | .440 | .312 | .174 | .908 | −.194 | .301 | .525 | .920 |
| Cohabiting compared to single | .199 | .210 | .346 | .959 | .098 | .205 | .633 | .976 |
| Married compared to single | −.198 | .212 | .356 | .933 | .292 | .212 | .175 | .939 |
| Divorced compared to single | .434 | .293 | .139 | .985 | −.217 | .372 | .565 | .919 |
| Widow/er compared to single | −.646 | .443 | .154 | .931 | .334 | .445 | .457 | .936 |
| Residence | −.009 | .126 | .944 | .946 | −.050 | .144 | .734 | .916 |
| Nr living in household | .007 | .069 | .923 | .912 | .000 | .063 | .998 | .943 |
| Nr of children | .065 | .067 | .336 | .961 | −.011 | .074 | .882 | .936 |
| Income | −.015 | .057 | .792 | .905 | .147 | .058 | .021 | .907 |
| Household income | .079 | .037 | .035 | .968 | −.072 | .060 | .266 | .874 |
| Time compared to | | | | | | | | |
| Past | .132 | .073 | .073 | .958 | −.058 | .072 | .424 | .970 |
| Future | −.111 | .065 | .095 | .953 | .046 | .069 | .512 | .942 |
| Wants | −.053 | .063 | .403 | .977 | .089 | .068 | .190 | .963 |
| Others | −.013 | .080 | .876 | .924 | .019 | .070 | .786 | .972 |
| Soc-emo compared to | | | | | | | | |
| Past | .496 | .094 | .000 | .937 | −.259 | .121 | .052 | .890 |
| Future | −.150 | .101 | .139 | .957 | .232 | .119 | .063 | .917 |
| Wants | −.107 | .129 | .423 | .887 | −.117 | .116 | .323 | .909 |
| Others | .169 | .113 | .152 | .909 | −.181 | .089 | .042 | .984 |

(Continued)
In some cases, these effects seem to be mediated through the resource assessments. Icelanders with a higher household income tended to be slightly more optimistic than those with lower levels of household income ($b_{pooled} = .14, SE_{pooled} = .05$). This effect is likely partially mediated through the relative resource assessment, as the explanatory power of household income decreased in the second step of the model ($b_{pooled} = .08, SE_{pooled} = .04$).

Compared to single people, both cohabiting ($b_{pooled} = .46, SE_{pooled} = .22$) and divorced Icelanders ($b_{pooled} = .68, SE_{pooled} = .33$) were more optimistic about the future. However, this effect was no longer statistically significant in the second model (compared to singles: cohabiting $b_{pooled} = .20, SE_{pooled} = .21$; divorced: $b_{pooled} = .43, SE_{pooled} = .29$). In contrast, having a third level education compared to a first level education was related to more optimism in both steps of the model (Step 1: $b_{pooled} = .60; SE_{pooled} = .22$; Step 2: $b_{pooled} = .54 SE_{pooled} = .19$). Other demographic variables such as gender, age and employment status were not associated with optimism. Females were however more worried than men ($b_{pooled} = .40; SE_{pooled} = .14$). This relationship remained unchanged when the resource assessments were added to the model ($b_{pooled} = .41; SE_{pooled} = .12$). Income levels were also related to worries. Beyond that, no other available demographic variables had a reliable relationship to worries. When resource assessments are added to the model, the explained variance of optimistic expectations ($R^2 = .24$) and worry ($R^2 = .19$) increased considerably. Unless otherwise stated, the results statistics mentioned in this part had $p$-values below .05. Thus, the resource assessment items both contributed to the models, and in some cases seem to serve as a mediating link between demographics and expectations.

Even though there were missing data in our sample we feel confident that we used the best method available to correct for this limitation. First, we used pooled beta values from all five imputed data samples to get the most accurate parameter estimates. Second, the relative efficiency of the multiple imputations was high, ranging between .87 and .99.
General discussion

Questions answered
Regardless of the theoretical consensus on positive interrelations among resources (Hobfoll, 2002), this has seldom translated into quantitative measurements of multiple resources. When several resources have been measured simultaneously within an integrated resource framework, the resources are typically measured by different instruments developed from different traditions. In our investigation, we addressed this by measuring four different resources simultaneously, using the same method. Our results show that the resource items formed three correlated but distinct and easily identifiable resources factors with good internal consistency. Further, using multiple resource types in our regression model lead to more explained variance in the dependent variables, and allowed us to control for the interrelationship between resources. Based on these promising results, further attempts to validate our items are encouraged.

Further, we found that economic and socio-emotional resources predicted future expectations beyond the role of demographic variables. In brief, participants who see their economic and socio-emotional resources as more abundant then they used to tend to have more optimistic expectations of, and fewer worries about, the future. We found that this pattern emerged after controlling for how much resources you have in reference to your wants, others, and the future. Instead of relying on theoretical assumptions of the primacy of one reference point over the other we tested this empirically and found that referring to the past was the strongest predictor in our model.

Questions generated
The role of temporal comparisons
Knowing how the participants assessed their personal resources in comparison to wants and others did not improve our model of how optimistic and worried our participants were. This is interesting, given that both reference points are typically seen as core comparisons underlying scarcity experience (Crosby, 1976; Festinger, 1954). How can these results be interpreted?

Perhaps these findings can best be seen as a reflection of the particular sample used in this study. The participants consist of Icelanders, who have since the global economic crisis of 2008 gone through much economic turmoil (Economy of Iceland, 2016). Although the nation had largely recovered financially by the time this study was conducted, the effects of the crisis still lingered on in the minds of Icelanders. According to Temporal Comparison Theory, in times of dramatic societal changes, temporal comparisons become more prominent. Focusing on comparing one's resources to the past may be an adaptive response, as anchoring evaluations to the past may help people function despite the uncertainty of the present and the future (Herman, 1992). Further lending support to this interpretation, our findings seem to be in line with previous research that has studied temporal relative deprivation in the context of dramatic change (de la Sablonnière et al., 2009, 2015).

However, in contrast to previous findings (de la Sablonnière et al., 2015), our data do not support that the future was an especially salient reference point for Icelanders. Since personal past can be retrieved from memory it may serve as a more stable anchor for assessment than the future. Our findings may suggest that Icelanders are still adapting to life after the crisis and therefore use the past as a reference point in order to inform their views about the future.
Although this interpretation of the results is probable, it is at this stage only speculative. In order to determine the role financial crisis play in making certain reference points more salient further research is needed. Preferably we would have liked to have measures from the same participants before and after the crisis. However, since that is not currently possible, conducting the same study in multiple countries, which in various ways were impacted by the crisis, could help with determining how it may have influenced the salience of reference points. Further, carefully designed experiments that simulate an economic crisis, may decipher whether comparing to the past may become more salient than comparisons to others, wants and the future during unstable times.

However, the effects of dramatic societal changes, such as the changes in the Icelandic society in recent years, would be difficult if not impossible, to simulate in the laboratory. A laboratory paradigm of dramatic societal changes risks becoming superficial and simplistic (Hill, 2006; Pancer, 1997; de la Sablonnière, Bourgeois, & Najih, 2013). We therefore encourage a combined approach of laboratory experiments and studies in the natural context in order to truly understand how societal changes may influence how people assess their resources.

The role of time resources

Why was the expected relationship between temporal resources and future outlook not observed? Considering the time pressure experienced by most people (Gunnarsdóttir, Petsold, & Povlsen, 2014; Roxburgh, 2002, 2004), this null finding is interesting. One might, for example, expect that lack of time would have consequences for constructs related to well-being, such as optimism and worry (Alarcon, Bowling, & Khazon, 2013).

Either temporal resources are relatively unimportant to Icelanders future expectations, or the relation to future expectations is moderated by some unknown variable. Perhaps the relationship between temporal resources and future expectations is not found because it is intertwined with economic resources. In fact, Hamermesh and Lee (2007) have suggested that the value of time is related to income. In support of this Hamermesh and Lee found that when you control for how much people work, income is related to increased time pressure. This was interpreted as an indication that with greater wealth the opportunity cost of time increases. Those with lower income may often have more time, but for them it is not worth as much. Future research could focus more on measuring the value individuals place on time, rather than the amount of time people feel that they have. In fact, some previous research indicates that satisfaction with time use is more important for well-being related outcomes than the amount of time people have (Boniwell, 2005; Boniwell, Osin, Linley, & Ivanchenko, 2010).

Limitations

The data used in this research relied solely on self-reports of resources and expectations. Self-reports have long been criticized for lacking validity since participants may give socially desirable answers and be unfocused or unmotivated. (e.g. Brener, Billy, & Grady, 2003; Fan et al., 2006; van de Mortel, 2008). Furthermore, certain demand characteristics, such as wording, format and context, may shape the answers to the questions (Schwarz, 1999). However, it may be argued that because both relative resource assessments and expectations are inherently internal and experiential, self-reports can offer good access to those internal experiences (Diener, 1994). Nonetheless, we encourage the use of other measuring approaches as well.
In a similar vein, the findings in this research come from cross-sectional correlational data. As such, no conclusion can be made about the direction of the relationship between relative resource assessment and future expectations. However, this is not just a matter of design, but is also a reflection of how many theorists view the relationship between resources and future expectations. The most common position in the resource literature is viewing the relationship between resources and well-being related variables as bidirectional (Hobfoll, 2002). More specifically, the relationship between optimism and resources is probably bidirectional, with optimists more adept at acquiring resources (Brissette, Scheier, & Carver, 2002; Chemers, Hu, & Garcia, 2001; Geers, Reilley, & Dember, 1998), while resource levels also influence optimism (Heinonen et al., 2006; Korkeila et al., 2004). Direct evidence of this bidirectional relationship was provided in a 10-year follow-up study that showed that dispositional optimism results in long-term resource growth and that increased resources predict increased optimism (Segerstrom, 2007). Similarly, there is evidence that worries are both genetically determined (Kotov et al., 2010) and related to resource levels (e.g. Lee & Dunkle, 2010).

A potential shortcoming resulting from the type of measurement used for this research is the amount of missing data. By measuring the same resource items with four different reference points our goal was to establish statistical and conceptual rigour. We acknowledge that repeating similar questions multiple times may come at the cost of increased attrition (Shadish, Cook, & Campbell, 2001). However, after following best practice recommendations for handling missing data, we found that on the whole our conclusions remained qualitatively the same.

Conclusions
Our results show that, on the personal level, the strongest predictor of future expectations is comparing one’s resources to the past while comparisons to wants, others, and the future, impact expectations considerably less. Our results may suggest that in times of dramatic societal change, temporal comparisons become the best anchor to subjectively evaluate the situation. When people in volatile times lose track of what they want and who to compare their resources to, and the future seems uncertain, only the past remains as a stable enough reference point for predictions. Although objectively speaking often a poor predictor of the future, the past may be the only anchor to hold on to when society is afloat.

Author contributions
All three authors contributed to the conception and design of this research. The data were collected by an Icelandic Internet Panel. The first author analysed the data with the assistance of second and the third author. The first author drafted the paper, which the second and third author reviewed. All authors approved the final version of the paper and take responsibility for its accuracy and integrity.

Compliance with ethical standards
The authors comply with the ethical standards of the journal. The manuscript has not been published elsewhere, although portions of this research were presented in the summer of 2014 at the International Congress of Applied Psychology in Paris, France, the International Society for Justice Research in New York, USA the same year and at the International Congress of Psychology in Yokohama, Japan in the summer of 2016. There are no conflicts of interests to declare.
with respect to the research, authorship, and/or publication of this article. The participants in this research gave informed consent for being a part of this study.

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# Appendix

## Survey design:

| Part 1: General resource assessments (reported in the paper) and ranking of resources and comparisons (not reported in the paper): 11 questions |
|---|
| The order of the resources and comparisons to be ranked was randomized |
| ↓ |
| Part 2: Relative resource assessments: 64 questions |
| Sub-parts: 2.1; 2.2; 2.3; 2.4 |
| Each sub-part was displayed in random order. Each sub-part had 16 items that were displayed in random order |
| ↓ |
| Part 3: Thoughts about the future: 2 questions |
| ↓ |
| Part 4: Background variables: 10 questions |

## Abbreviation RRA items

| Abbreviation | RRA items | Part. Sub-part. |
|--------------|-----------|-----------------|
| CUSN         | Compared to what I’m used to, I feel that I have… a smaller or larger social network now than before | 2.1 |
| CUSR         | …fewer or more close relationships now than before | 2.1 |
| CUSF         | …fewer or more friends now than before | 2.1 |
| CUSA         | …fewer or more acquaintances now than before | 2.1 |
| CUESe        | …less or more emotional security now than before | 2.1 |
| CUEL         | …less or more love now than before | 2.1 |
| CUESu        | …less or more emotional support now than before | 2.1 |
| CUET         | …less or more trust now than before | 2.1 |
| CUTH         | …less or more time for interests and hobbies now than before | 2.1 |
| CUT          | …less or more time now than before | 2.1 |
| CUTR         | …less or more time to relax now than before | 2.1 |
| CUTO         | …less or more time for others who are important to you now than before | 2.1 |
| CUEcI        | …less or more income now than before | 2.1 |
| CUEcM        | …less or more money now than before | 2.1 |
| CUEcSa       | …less or more savings now than before | 2.1 |
| CUEcSp       | …less or more money for spending now than before | 2.1 |
| COSN         | Compared to what others who are important to you have, I feel that I have… a smaller or larger social network | 2.2 |
| COSR         | …fewer or more close relationships | 2.2 |
| COSF         | …fewer or more friends | 2.2 |
| COSA         | …fewer or more acquaintances | 2.2 |
| COESe        | …less or more emotional security | 2.2 |
| COEL         | …less or more love | 2.2 |
| COESu        | …less or more emotional support | 2.2 |
| COET         | …less or more trust | 2.2 |
| Abbreviation | RRA items                                                                 | Part. Sub-part. |
|--------------|--------------------------------------------------------------------------|-----------------|
| COTH         | …less or more time for interests and hobbies                              | 2.2             |
| COT          | …less or more time                                                        | 2.2             |
| COTR         | …less or more time to relax                                               | 2.2             |
| COTO         | …less or more time for others who are important to you                    | 2.2             |
| COEcl        | …less or more income                                                      | 2.2             |
| COEcm        | …less or more money                                                       | 2.2             |
| COEcsa       | …less or more savings                                                    | 2.2             |
| COEcsSp      | …less or more money for spending                                          | 2.2             |
| CWSN         | Compared to what I want, I feel that I have…a smaller or larger social network | 2.3             |
| CWSR         | …fewer or more close relationships                                        | 2.3             |
| CWSF         | …fewer or more friends                                                   | 2.3             |
| CWSA         | …fewer or more acquaintances                                              | 2.3             |
| CWESe        | …less or more emotional security                                          | 2.3             |
| CWEL         | …less or more love                                                       | 2.3             |
| CWESu        | …less or more emotional support                                          | 2.3             |
| CWET         | …less or more trust                                                      | 2.3             |
| CWTH         | …less or more time for interests and hobbies                              | 2.3             |
| CWT          | …less or more time                                                        | 2.3             |
| CWTR         | …less or more time to relax                                               | 2.3             |
| CWTO         | …less or more time for others who are important to you                    | 2.3             |
| CWecl        | …less or more income                                                      | 2.3             |
| CWeCM        | …less or more money                                                       | 2.3             |
| CWeCsA       | …less or more savings                                                    | 2.3             |
| CWeCSp       | …less or more money for spending                                          | 2.3             |
| CFSN         | Compared to what I think I will have in the future, I now have…a smaller or larger social network | 2.4             |
| CFSR         | …fewer or more close relationships                                        | 2.4             |
| CFsf         | …fewer or more friends                                                   | 2.4             |
| CFSA         | …fewer or more acquaintances                                              | 2.4             |
| CFSEs        | …less or more emotional security                                          | 2.4             |
| CFEL         | …less or more love                                                       | 2.4             |
| CFESu        | …less or more emotional support                                          | 2.4             |
| CFET         | …less or more trust                                                      | 2.4             |
| CFTH         | …less or more time for interests and hobbies                              | 2.4             |
| CFT          | …less or more time                                                        | 2.4             |
| CFTR         | …less or more time to relax                                               | 2.4             |
| CFTO         | …less or more time for others who are important to you                    | 2.4             |
| CFEcl        | …less or more income                                                      | 2.4             |
| CFEcm        | …less or more money                                                       | 2.4             |
| CFEcsA       | …less or more savings                                                    | 2.4             |
| CFECSp       | …less or more money for spending                                          | 2.4             |