The Identity Resilience Index: Development and Validation in Two UK Samples

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Abstract

Identity resilience is conceptualized in Identity Process Theory as a relatively stable self-schema, akin to a trait. Identity resilience is said to be high when individuals perceive their identity to be characterized by a high overall combined rating of their self-efficacy, self-esteem, continuity and distinctiveness. People reporting higher identity resilience respond more favorably to, and cope more effectively with, events and situations that question or threaten their identity. The Identity Resilience Index (IRI) is a 16-item self-report measure of identity resilience. Confirmatory factor analysis was performed on data from 465 participants in two studies in the United Kingdom who completed the IRI and the Positive Affect Scale. Results revealed a second-order factor model in which every item loaded onto one of four first-order identity dimensions (self-esteem, self-efficacy, continuity and distinctiveness) and indicated these four first-order dimensions loaded onto a higher-order identity factor (identity resilience). Overall, we found no statistically significant differences on the IRI by population (general vs. gay men). The IRI correlated positively with the Positive Affect Scale, suggesting good concurrent validity.

Keywords: identity resilience; identity; identity process theory; self-efficacy; self-esteem; distinctiveness; continuity; scale validation

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Introduction

Identity Process Theory (IPT) recognizes that people are habitually exposed to stressors, that is, events and situations that can challenge their sense of identity and cause psychological stress. Empirical research using IPT has shown that a 'resilient' sense of identity, characterized by relatively higher levels of self-esteem, self-efficacy, continuity and positive distinctiveness, is protective against the negative psychological sequelae of adverse events and situations (Breakwell & Jaspal, 2021a). Identity resilience is likely to influence cognitions, emotions and action in relation to threatening events and situations and indeed their management at an individual level. The concept has been used in various empirical contexts, such as the COVID-19 pandemic, recalling negative memories from the past, and when disclosing a stigmatized identity to others (such as being gay) – in these contexts, identity resilience has been shown to reduce negative affect (Breakwell & Jaspal, 2021a, 2021b; Ritchie, Sedikides & Skowronski, 2016). Consequently, the construct is empirically useful for modelling social, psychological and behavioral responses to adverse events and situations and, on a practical level, it may be useful for practitioners working with groups and individuals at risk of developing negative affect and identity threat. Yet, in order to capitalize on the concept of identity resilience, and to examine its correlates, antecedents and consequences, it is important to develop a robust, reliable, and valid measure of it. In this article, we describe the psychometric properties of the Identity Resilience Index, which is a 16-item self-report measure of the construct.

Identity Process Theory

Identity Process Theory (Breakwell, 2001; 2015a; 2015c) posits that identity construction typically consists of two concurrent processes: *assimilation-accommodation* refers to the absorption of novel content elements into the identity configuration and *evaluation* entails the allocation of meaning and value to the contents of identity. In assimilating-accommodating and evaluating identity contents, people strive to achieve a sense of identity characterized by self-esteem, self-efficacy, personal continuity, and positive distinctiveness. Empirical research demonstrates the cross-cultural significance of these identity principles although they may be manifested differently (Vignoles et al., 2006). People actively attempt to enhance each of these four 'identity principles' (which are sometimes called identity motives). When the identity principles are unable to be satisfied due, for instance, to changes in their social or personal circumstances, the individual is said to experience identity threat, which is aversive and can harm psychological wellbeing if coping mechanisms are inadequate. In response to identity threat, people endeavor to restore what they believe are satisfactory levels of the identity principles. They engage in coping activities at intra-psychic, interpersonal, group, intergroup, and societal levels in order to protect the identity principles and to respond appropriately to experiences that might undermine them (Breakwell, 2015b; Chryssochoou, 2014; Jaspal, 2018; Lyons, 1996).

Identity resilience: conceptual underpinnings

Recent developments in IPT (Breakwell, 2020a, 2020b; Breakwell & Jaspal, 2021a, 2021b) have focused upon the concept of identity resilience. Identity resilience is said to be high when individuals perceive their identity configuration to be characterized by a high overall combined rating of their self-efficacy, self-esteem, continuity and positive distinctiveness. It reflects one's subjective belief in one's capacity to interpret and overcome challenges as they occur, one's self-worth and value, certainty of who one is and will remain despite individual and social changes that occur, and one's self-construal as unique and positively distinctive.

Theories of identity processes tend to focus on particular identity principles, such as distinctiveness (Brewer, 1991) and self-esteem (Tajfel & Turner, 1986). These theories imply that one particular principle plays a more significant role than others in shaping identity processes. Conversely, IPT rejects the notion that any particular identity principle is universally more significant than others and emphasizes their collective operation and the dynamic function of identity processes (Breakwell, 2015c). Indeed, research using IPT has found that self-esteem, which is often presented as a 'super principle', is no more significant than other principles; and that continuity, self-efficacy and distinctiveness should be given equal theoretical consideration in models of identity processes (Vignoles, Chryssochoou & Breakwell, 2002). Identity resilience essentially reflects the individual's capacity to maintain a stable sense of identity in the face of change. Such stability is ensured by maintaining a subjective sense that levels of all four identity principles are appropriately high. To that extent, identity resilience can be thought of as a super-ordinate state of identity. Consequently, it is important for any measure of identity resilience to capture subjective ratings of each of the four identity principles.

In IPT, identity resilience is conceptualized as a stable self-schema, akin to a trait. Over the life course, the individual will develop a sense of their identity resilience, that is, the extent to which their identity is *generally* characterized by the four principles. This perception of identity resilience is based on many social phenomena and experiences, such as group memberships, education, exposure to cultures, religion (e.g., Jetten et al., 2015; Smeekes & Verkuyten, 2015). However, it is also based on individual characteristics (some of which are also partially determined by social experiences) for instance, personality traits, intellectual capacity, or physical abilities (e.g., Bardi et al., 2014).

Given the complex roots of identity resilience, it is to be expected that the way in which the four components are combined and are rated will vary according to social (for instance, cultural) and individual (for instance, educational attainment) parameters. Different combinations may result in the same overall level of identity resilience but the core constituents contribute differentially. For instance, individual differences, such as personality traits, are likely to be important. In their study of value orientations and identity processes, Bardi et al. (2014) found that the conservation value (i.e., valuing security, conformity and tradition) moderated the relationship between continuity and identity enactment, suggesting that, for individuals who value conservation, the more an identity element (e.g., being an ethnic group member) provides a sense of continuity, the more important that identity element is for the individual. Therefore, it is likely that value orientations and priorities (a relatively stable individual personality trait) are likely to shape the individual's subjective configuration of identity resilience in that one might expect an individual who values conservation to have a higher continuity input in their sense of identity resilience than other principles. Yet, IPT also emphasizes the resourcefulness of the individual constructing a sense of identity and it is thus possible that, in specific cultural contexts, individuals will accentuate some principles over others in order to derive an individually acceptable sense of identity resilience (Breakwell, 2015a).

While identity resilience is not fleeting or highly situation specific, it is expected that there is variability in it (just as there is in some personality and behavioral traits, see for example Bardi et al., 2009; Roberts & Mroczek, 2008). Variability is predictable based on the operation of the coping strategies used to manage any emerging threats to identity. For instance, faced with having to recall a particularly negative memory of having been rejected by significant others, the individual, at that moment, may experience some challenge to self-esteem. Higher identity resilience would result in the individual being less likely to perceive any actual decrement in self-esteem. The coping mechanism at work might be intra-psychic denial or interpersonal self-justification. Identity resilience supports the effective operation of the defensive coping tactics that are used. Once generated, identity resilience creates the platform for being able to defend identity more effectively in the future. In being an agent of identity defense, it is useful for identity resilience to be malleable – the combination of the four principles means that, when one is under pressure, the others can be brought to the fore to adjust against the threat. Differential prioritization over time and circumstances is to be expected (Breakwell, 2015a). Resilience is also about 'bounce back', that is recovery - the higher the identity resilience, the greater the capacity to reconstruct an identity configuration which is personally satisfying and defensible in the future.

The four identity principles are used in combination in assessing identity resilience because, while they are each conceptually distinct constructs, together they explain more of what motivates identity processes. It is recognized that they have somewhat different etiologies and have been shown empirically to predict behavior, thought and affect differentially. Yet, they do overlap. Significant correlations between self-esteem and self-efficacy are regularly found (Gardner & Pierce, 1998; Lane, Lane & Kyprianou, 2008; Lightsey et al., 2006), and both correlate with continuity and positive distinctiveness (Sharma et al., 2020; Wang & Xu, 2015). Introducing the identity resilience construct allows us to capitalize on the synergies of the four in predicting responses to stressors. In developing the Identity Resilience Index, it became evident that measures that previously have been used to scale the four principles independently do indeed coalesce to reveal a superordinate factor.

Identity Resilience: Its Conceptual Distinctiveness

There are many existing measures of general resilience, which have been reviewed elsewhere (Windle et al., 2011). The concept itself refers to the individual's ability to 'bounce back' in

the face of various challenges that they face across the life course, such as ill-health. General resilience tends to be focussed on the individual's capacity to deflect the impact of the challenge. Many of the measures focus almost exclusively on personal agency when exposed to a stressor but the underlying psychological traits that facilitate such 'bounce back' are implicit and left to be inferred. In contrast, in IPT, it is explicitly hypothesized that subjective feelings of self-efficacy (one's own subjective construal of control and competence, which is akin to personal agency) as well as distinctiveness, continuity and self-esteem are collectively central to determining not only immediate responses to a stressor but also the ability subsequently to cope effectively. Therefore, in contrast to existent measures of resilience, we propose the concept of *identity* resilience. This construct goes beyond the exclusive focus on personal agency (or self-efficacy) to incorporate the stability of identity itself (characterized by all four prime principles). Identity resilience operates, through the identity processes of assimilation-accommodation and evaluation, to marshal dynamic adjustments in the self-schema that allow the implications of stressors not simply to be deflected but, more importantly, to be reconceptualized and re-evaluated and become contributions to the evolving identity. Identity resilience can be thought of as a super-ordinate state of identity.

There is much empirical evidence to suggest that a focus on identity resilience is warranted and important for understanding how stress is managed by the individual and identity remains intact when the individual faces a stressor (with the capacity to 'threaten' identity). The identity resilience concept, while based squarely in IPT, can be used alongside a number of other theoretical models that are currently utilized to explain how people react to risk and threats and seek to adapt in order to cope. For instance, it is compatible with the approach of Ritchie, Sedikides and Skowronski (2016) who characterize a 'strong' sense of identity in terms of the self-regulatory goals of esteem, continuity and meaningfulness. Identity resilience can also be seen as a potential ingredient supporting the social cure perspective (Jetten, Haslam & Haslam, 2012) on responses to debilitating psychological or physical trauma. The social cure perspective suggests that both strength of identification with meaningful social groups and the number of groups with which one identifies promote psychological wellbeing and effective coping in the face of stressors. Identity resilience would be seen as facilitating the capacity to develop meaningful identifications and to integrate them effectively into existing identity configurations.

Identity resilience is a construct that will have many future explanatory and predictive uses. Each of the four components of identity resilience has been shown individually to be instrumental in facilitating favorable coping responses to stressors (Brewer, 1991; Dumont & Provost, 1999; Sadeh & Karniol, 2012). Recent research into the concept of identity resilience (Breakwell & Jaspal, 2021a, 2021b) has demonstrated that it is a moderator and mediator of responses to threat. However, if it is to be useful, it is important to have a reliable and valid index of the construct.

The Identity Resilience Index

This article describes the psychometric properties of the Identity Resilience Index (IRI), which provides an overall measure of identity resilience with indicators for each of the four prime identity principles. The IRI is a composite measure, including items from four extant scales, namely the Rosenberg Self-Esteem Scale (Rosenberg, 1965), the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995), the Southampton Self-Continuity Index (Wildschut et al., 2006) and the Sense of Uniqueness Scale (Şimşek & Yalınçetin, 2010) for examining self-esteem, self-efficacy, personal continuity and positive distinctiveness, respectively. These scales were deemed to constitute appropriate bases for the IRI principally because of their reliability and validity across many studies for measuring each principle, as conceptualized in

IPT. Moreover, using well-established, existent scales enable us to link the concept of identity resilience to existing theory and research into the four principles of identity.

It is noteworthy that we did not use all of the items from each scale, largely because extant measures tend to embed several aspects of the broad constructs that they address. Therefore, we extracted from the scales only those specific items which were deemed to be particularly consistent with IPT's foci on the subjective perception of one's own levels of the principles; personal value (rather than social value); self-confidence and resourcefulness in the face of challenges; positive distinctiveness (rather than just distinctiveness *per se*); and sense of continuity between past and present despite external change (see Breakwell, 2015a; Breakwell, 2020a, 2020b; Breakwell & Jaspal, 2021b).

The IRI was designed to offer a short and accessible index of one's own subjective construal of identity resilience. The clarity and specificity of the IRI makes it more amenable to use in both cross-sectional and longitudinal research. It can be used to monitor change in identity resilience over time as well as indicating its level at one time. In view of evidence that identity resilience is associated with reduced identity threat and negative affect (Breakwell & Jaspal, 2021a; Ritchie, Sedikides & Skowronski, 2016), there is a need for a psychometric measure assessing identity resilience invariantly across different populations, especially if in populations that are likely to differ in their degree of exposure to stressors with the potential to identity threat (e.g., gay men exposed to homonegativity; see Breakwell & Jaspal, 2021b). In previous research using IPT, gay men from disparate cultural backgrounds have been shown to face distinct types of identity threat (relating mainly to their sexuality) from those experienced in the general population (see Jaspal, 2019). Therefore, in order to develop a measure that can facilitate comparisons of groups facing distinct types of threat, we included data using the IRI from the general population and gay men. We had no a priori reason to believe that the psychometric properties of the IRI should be different between heterosexual and gay male samples. We were not seeking to explore differences between the two samples in this study using the IRI.

Analytical Model and Hypotheses

We operationalized the theoretical postulates of Identity Process Theory into an analytical model based on the statistical framework of Structural Equation Modeling (SEM), using Confirmatory Factor Analysis (CFA) to test our hypotheses. The choice of the statistical framework was guided by the need to test the hypothesis of identity resilience being a higher-order latent construct, explaining the covariation between the set of observed variables, allowing us to model measurement error and accurately estimate the reliability of the identified solution (Bollen, 1989).

In particular, we aimed to ascertain whether identity resilience represents a higher-order latent dimension explaining self-esteem, self-efficacy, continuity, and positive distinctiveness, each measured through a selection of observed variables from extant and established measures. For this purpose, we compared the fit of three alternative models to the data, underlying alternative theoretical assumptions: (i) our hypothesized model; (ii) a model in which one single dimension of identity resilience explained all the variance of the observed variables; and (iii) a four-factor model of self-esteem, self-efficacy, continuity, and distinctiveness, with no specification of an identity resilience dimension.

Therefore, in accordance with Identity Process Theory, and the earlier research in this area, the following hypotheses were formulated:

H1: Confirmatory factor analysis (CFA) will support the second-order factor model, in which every scale item will load onto one of four first-order observed identity dimensions, namely self-esteem, self-efficacy, continuity and distinctiveness.

H2: The four first-order dimensions of self-esteem, self-efficacy, continuity, and distinctiveness will load onto a higher-order latent identity factor, namely identity resilience.
H3: The factor structure of the IRI will be invariant across the general population vs. gay men.

Methods

Ethics

The studies received ethics approval from Nottingham Trent University's College of Business, Law and Social Sciences Research Ethics Committee (ref: 2020/191 and 2020/189). All participants provided informed consent online.

Participants

Participant samples from two distinct populations were recruited to provide data on the four extant scales upon which the IRI is based. A convenience sampling approach was employed to recruit a general population sample (Study 1, $N = 227$) on 14 August 2020 and, subsequently, a sample of gay male participants (Study 2, $N = 246$), using the same sampling strategy, on 3 November 2020. In total, 473 participants completed the study procedure. There were 318 (67.23%) males, 154 (32.56%) females, and 1 (0.21%) gender non-binary individual. The age of participants ranged from 18 to 74 years ($M = 33.10$, $SD = 12.14$), and they came from various ethnic and socio-demographic backgrounds. Table 1 provides details on their social and demographic characteristics.

Insert Table 1 here

Procedure

In both studies, inclusion criteria required participants to be at least 18 years old and, additionally in the second study, to have a gay sexual orientation. Participants were all recruited on *Prolific*, an online participant recruitment platform, where they were invited to participate in a study of identity resilience during the COVID-19 pandemic (Study 1) and in relation to their experience of coming out as gay (Study 2). Each participant was debriefed, signposted to available support and counselling services in the UK should they wish to use them, and paid a token amount for their time.

Measures

Both studies used adapted versions of four established and valid measures of self-esteem (Rosenberg, 1965), self-efficacy (Schwarzer & Jerusalem, 1995), continuity (Wildschut et al., 2006), and distinctiveness (Şimşek & Yalınçetin, 2010). The adaptation of the scales entailed a process of item selection based on a qualitative evaluation of the content of the original scales, informed by the principles of Identity Process Theory. The objective was to retain those items that represented the best candidates for specifically measuring identity resilience, as defined by the theory, and substantially preserving the construct validity of the first-order constructs. In the remainder of this section, all measures used in both studies and their characteristics are described.

Self-esteem

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) is a 10-item measure of general self-esteem. Items were scored on a 5-point ordinal Likert scale, ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"), with higher scores indicating higher self-esteem. The scale has high internal consistency (Cronbach' s alpha = 0.90) and test-retest reliability (0.85; Silber

& Tippett, 1965). In particular, based on our theoretical assumptions, we selected the following four items from the original scale, to be included in our model: (SS1) "On the whole, I am satisfied with myself."; (SS5) "I feel I do not have much to be proud of."; (SS6) "I certainly feel useless at times."; and (SS9) "All in all, I am inclined to feel that I am a failure.".

Self-efficacy

The General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) is a 10-item measure of general self-efficacy. Items were scored on a 5-point Likert scale, ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"), with higher scores indicating higher self-efficacy. The scale has been translated in several languages, showing in all cases satisfactory values of internal consistency (Cronbach's alpha values ranging from 0.76 to 0.90). We used a selection of four items from the original scale, to test our theoretical model, namely (SF1) "I can always manage to solve difficult problems if I try hard enough."; (SF2) "If someone opposes me, I can find the means and ways to get what I want."; (SF4) "I am confident that I could deal efficiently with unexpected events."; and (SF5) "Thanks to my resourcefulness, I know how to handle unforeseen situations.".

Continuity

The Southampton Self-Continuity Index (Wildschut et al., 2006) is a 10-item measure of one's sense of continuity of the present self, compared to the past self. Items were scored on a 5-point Likert scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"), with higher scores indicating higher sense of continuity. Research showed that the scale is internally consistent (Cronbach's alpha = 0.80; Ritchie et al., 2011). We retained the following five items from the original version of the scale to be tested in our model: (CN5) "My past and present flow seamlessly together."; (CN6) "My present is a simply continuation of the past."; (CN7) "There is continuity between my past and present."; and (CN8) "My past merges nicely into my present.".

Distinctiveness

The Sense of Uniqueness Scale (Şimşek & Yalınçetin, 2010) is a 5-item measure of personal sense of uniqueness. The scale includes six items scored on a 5-point Likert scale, with scores ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"). Şimşek and Yalınçetin (2010) found that the scale is internally consistent (Cronbach's alpha = 0.81) and correlates (r = .65) with Rosenberg's Self-Esteem Scale. We incorporated the following four items from the original scale, into our model: (DS2) "I feel unique."; (DS3) "I cannot think of many special characteristics that distinguish me from others."; (DS4) "I think the characteristics that make me up are different from others' characteristics."; (DS5) "I feel that some of my characteristics are completely unique to me.".

Positive affect

The Positive Affect Subscale from the Positive and Negative Affect Scale (Watson, Clark & Tellegen, 1988) is a 10-item measure, with scores ranging from 1 ("Very slightly or not at all") to 5 ("Extremely"). The scale included items such as "interested", "proud", "strong" and "alert". The scale was internally consistent (Cronbach's alpha = 0.91 [95% CI = 0.90-0.92]; N = 473).

Statistical analyses

We tested our hypotheses that the selected items from the four extant psychometric scales could be summarized into four latent identity dimensions of self-esteem, self-efficacy, continuity and distinctiveness, and that those four dimensions loaded onto a higher-order identity factor, by

using second-order Confirmatory Factor Analysis (CFA). CFA is a technique that allows one to test the fit of a theoretical model to a set of observed variables. In second-order CFA, the hypothesis that a set of first-order latent factors underlie a higher-order latent dimension is tested.

We tested three CFA models, namely: (1) all items loading onto a single, first-order identity resilience factor; (2) each item loading onto one of four first-order factors of self-esteem, self-efficacy, continuity, and distinctiveness, respectively, and factors left free to correlate; (3) each item loading onto one of four first-order factors, and the latter loading onto a second-order factor of identity resilience. We used the MLM method (Satorra & Bentler, 1994) to estimate scaled statistics and robust standard errors.

Model choice and selection were determined on the basis of a series of fit indices and criteria, particularly to test the fit of the higher-order model-implied variance-covariance matrix to the observed variance-covariance matrix. Following recommendations from the literature (e.g., Bollen, 1989; Kenny, 2020), we used the following fit indices to evaluate the fit of the model: The Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). We considered CFI $\geq$ 0.95, RMSEA < 0.06 and SRMR < 0.80 as indicative of acceptable fit (Kenny, 2020). We evaluated the goodness of the fit of the second-order factor model by taking into account the following criteria: change in model fit, the magnitude of residualized factor loadings on first-order factors, and the overall reliability of the model. As pointed out by Brown (2006), the second-order solution was not expected to improve goodness of fit relative to the first-order solution, and therefore we considered the second-order factor solution as the most suitable to represent if not resulting in a substantial decrease in model fit. Residualized factor loadings represent indicators of the unique contribution of first-order factors to the prediction of observed variables, allowing for the maximization of the variance explained by the second-order dimension (Brown, 2006; Schmid and Leiman, 1957) To evaluate the reliability of the model, we used coefficient omega (McDonald, 1999; Raykov, 2001) and we produced three different estimates, obtained by separating the model-implied covariance matrix into three main sources, respectively: (1) The variance explained by the higher-order identity factor (omega L1); (2) the residualized variance of the first-order identity process factors (omega L2); and (3) the proportion of observed variance explained by the second-order dimension after partialling out the uniqueness of first-order factors (partial omega) (Brown, 2006; Jorgensen et al., 2020). We assessed the uncertainty associated with model selection by estimating the corrected Akaike Information Criterion (AICc) and we used the difference between AICc scores as a measure of the degree of uncertainty associated with selecting the worst fitting model relative to the best fitting model. We used the cut-off values reported by Burnham, Anderson and Huyvaert (2011) to inform the selection, with a difference around 2 points indicating substantial support to the model and within the 2-7-point range indicating that the model has some support and should not be dismissed. Finally, we tested for configural, metric, and scalar invariance of the model, between individuals from the general population and gay men, respectively. The assessment of measurement invariance via MGCFA consists of testing "the equivalence of measured constructs in two or more independent groups to assure that the same constructs are being assessed in each group" (Chen et al., 2005, p. 472). In particular, the procedure aimed to establish invariance as a property of measurement, underlying the assumption that, although the scores on the observed variables may vary depending on individual differences and group membership, the hypothesized relationship between observed variables and latent dimensions should remain stable (Asparouhov & Muthén, 2014). In the specific case of identity resilience, we moved from the hypothesis that, although group membership may determine different levels of exposure to identity threat and coping response,

the relationship between identity resilience and self-esteem, self-efficacy, continuity, and distinctiveness is invariant across groups.

The first step includes testing for configural invariance, namely that the factor structure of the model is equivalent between the groups. The second step consists of the test of metric invariance, namely equivalence of factor scores between groups (e.g., in the case of gender, that identity resilience construct, as measured by the IRI, is equivalent for women and men). The third step involves testing for the equivalence of intercepts across groups (e.g., in the case of gender, that a given mean score on the IRI represents the same level of identity resilience, for women and men). However, testing for measurement invariance in second-order CFA requires additional steps. Following the procedure illustrated by Chen et al. (2005), we took these sequential steps in testing: (1) the configural invariance of the model; (2) the metric invariance on first-order factor loadings; (3) the metric invariance on first- and second-order factor loadings; (4) the scalar invariance on first-order factor loadings and intercepts of measured variables; (5) the scalar invariance on first- and second-order factor loadings, intercepts of measured variables means of first-order factors. The configural model represents the baseline multi-group, unconstrained model. Metric invariance means that items do not differ in their contribution to the first-order factors between groups, and similarly, that first-order factors contribute to a similar extent to determine the second-order latent dimension. Scalar invariance means that mean differences in the first-order latent factors are not due to differences in scale properties between different groups, nor are mean differences in the second-order dimension (Chen et al., 2005).

To evaluate invariance across the nested models we used the recommendations by Chen (2007) for small groups' sample sizes, including the following cutoff criteria: For testing metric invariance, a change of ≤ -.005 in CFI (DCFI) supplemented by a change of ≥ .010 in RMSEA (DRMSEA) and a change of ≥ .025 in SRMR (DSRMR) as indicative of non-invariance; for testing scalar invariance, a change of ≤ -.005 in CFI supplemented by a change of ≥ .010 in RMSEA and a change of ≥ .005 in SRMR as indicative of non-invariance (Chen, 2007).

We tested for the assumption of data being normally distributed by evaluating skewness and kurtosis of the distributions of observed variables, accepting values comprised between -2 and +2 as indicative of univariate normality, and by computing Mahalanobis' distance to detect multivariate outliers. Routine data screening, descriptive analyses and test of assumptions were performed on the full sample (N = 473), IRI item intercorrelations and validity analysis were performed after removing multivariate outliers (N = 465). We tested the measurement model via second-order CFA and MGCFA on two equally sized, randomly extracted sub-samples, overall maintaining the demographic composition of the total sample.

All analyses were performed by using the statistical programming language R (Version 3.6.2) (R Core Team, 2020) and the following packages: lavaan (Rosseel, 2012) for CFA, and semTools (Jorgensen et al., 2020) for reliability.

Results

Preliminary Data Screening

We found no unengaged patterns of responses (SD < 0.3) across all observed variables. Overall, variables had values of skewness and kurtosis comprised between -1.0 and 1.4, indicative of univariate normally distributed data. Eight response patterns were identified as multivariate normal outliers and were excluded from further analyses. Table 2 presents descriptive statistics, and correlations.

Table 2 here

We split the remaining total sample (N = 465) in two randomly selected sub-samples with approximately equal sample sizes. We tested our measurement model in sub-sample 1 (N = 232) and proceeded with MGCFA on sub-sample 2 (N = 233).

Confirmatory Factor Analysis

First, we tested a model with all items loading onto a general, single latent factor, representing identity resilience. The fit of the model was unsatisfactory (CFI = 0.45, RMSEA = 0.17 [90% CI = 0.16-0.19], SRMR = 0.16). Second, we tested a model in which every item loaded onto one of four identity process factors. The model had satisfactory fit (CFI = 0.96, RMSEA = 0.05 [90% CI = 0.04-0.07], SRMR = 0.06), with the following correlations observed between factors (Pearson's r): Self-Esteem and Self-Efficacy = 0.59, Self-Esteem and Continuity = 0.45, Self-Esteem and Distinctiveness = 0.21; Self-Efficacy and Continuity = 0.30, Self-Efficacy and Distinctiveness = 0.33; Distinctiveness and Continuity = 0.07. Finally, we tested a second-order factor model in which each item loaded onto one of four first-order factors, and the latter loaded onto a second-order latent identity dimension. The model fit was: CFI = 0.95, RMSEA = 0.05 [90% CI = 0.04-0.07], SRMR = 0.07. Results from Satorra and Bentler's (2001) scaled chi-squared difference test, conducted at alpha = 0.05, showed no significant difference between the second-order factor model (chi-square difference$_{(df)}$ = 5.31 $_{(2)}$, p = 0.07), suggesting the suitability of the second-order factor solution to represent the data. The residualized factor loadings estimated from the second-order factor model were all > 0.34 (Table 3) and we found omega values to be 0.66 for L1, 0.68 for L2, and 0.89 for partial omega.

Table 3 here

Collectively, these findings supported the suitability of the second-order factor model (Figure 1). Each sub-scale was internally consistent (SS: alpha = 0.88 [95% CI = 0.86-0.90; N = 465]; SF: alpha = 0.79 [95% CI = 0.76-0.82; N = 465); CN: alpha = 0.89 [95% CI = 0.87-0.90; N = 465]; DS: alpha = 0.79 [95% CI = 0.76-0.82; N = 465]; total scale alpha = 0.85 [95% CI = 0.83-0.87], N = 465).

Figure 1 here

The results from the analysis of uncertainty associated with model selection showed an AICc difference of 2.58 (AICc observed in the higher-order model = 8969.35 vs. 8966.76 in the first order model), supporting the plausibility of the higher-order solution.

We therefore used the second-order factor model in a series of nested MGFCAs, aiming to test for factor invariance between different population groups (general vs. gay men, respectively). Results showed no significant change when constraining first-order and second-order factor loadings, respectively, indicating that the metric invariance of the IRI could be established. Regarding scalar invariance, when we constrained the intercepts of observed variables, we found the following changes in fit indices: DCFI = -0.01, DRMSEA = 0.01, and DRSMR = 0.00. We explored the model's parameters and noticed that constrained intercepts for items DS4 ("I think the characteristics that make me up are different from others' characteristics.") and DS5 ("I feel that some of my characteristics are completely unique to me.") could be released achieve better fit. Finally, we found no significant change in model fit when constraining second-order latent means, in comparison to the partially invariant first-order scalar model. Table 4 reports detailed fit indices.

Table 4 here

Concurrent validity

We ran correlation analyses between the IRI total and sub-scale scores and the positive affect scale. Total scores were computed by summing up items for each scale, and we used the Spearman's rho coefficient to compute correlations. In all cases, correlations were positive and low (Total IRI = 0.28; SS = 0.24; SF = 0.21; CN = 0.13; DS = 0.18).

Discussion

The analysis of the statistical properties of the Identity Resilience Index (IRI) revealed a second-order factor model in which every item loaded onto one of four first-order identity dimensions (self-esteem, self-efficacy, continuity and distinctiveness), supporting H1, and the four first-order dimensions of self-esteem, self-efficacy, continuity and distinctiveness in turn loaded onto a higher-order latent factor of identity resilience, which supported H2. Using relevant items from four extant scales of self-esteem, self-efficacy, continuity and distinctiveness, the analysis confirms a key tenet of Identity Process Theory (Breakwell, 2015a), namely that the four principles are conceptually distinct. However, their correlations determine a broader dimension of identity resilience.

Accordingly, the IRI enables the researcher to examine identity resilience as a general self-schema akin to a trait, while capturing empirically the distinct ways in which the four components of the construct may be differentially rated and combined in any particular social context. Indeed, a key hypothesis of Identity Process Theory is that, when one identity principle (e.g., self-esteem) is under pressure, others (e.g., continuity) may be brought to the fore to cope with the threat. Identity resilience is reliant on the relationship between the four constituent elements and their relative contributions will vary over time and with circumstances. It is the fact that together they can compensate for an inadequacy that any one of them may exhibit that results in resilience. Having a higher rating across the four reflects a greater overall identity resilience precisely because it indicates a greater capacity for compensatory adjustments required when facing a threat. Having a measure that enables researchers to examine identity resilience as a unitary construct but also the unique contribution of each of the four constituent principles to overall identity resilience is important.

The focus of this article is on the development and analysis of the factor structure of the IRI. The second-order factor structure shows acceptable reliability. Further research is necessary to establish more accurate estimates of reliability, in view of the complexity of the model and the sample size required to generate more conclusive evidence. However, the positive correlations between IRI total scores and positive affect provided some evidence of its concurrent validity. This conforms to the suggestion that having a more resilient identity is in turn associated with the ability to retain a higher level of psychological wellbeing (conceptualized in our study as positive affect) in the face of possible psychological stressors. This would appear to be consistent with the observation that identity resilience attenuates the perception of threat by supporting the effective enactment of coping strategies in defense of one's identity. Identity resilience is thought to influence the individual's capacity to respond effectively to stressors with the potential to undermine identity. However, the low correlations found suggest the need for future research, which should focus on examining correlations between IRI scores and other psychological wellbeing measures, as well as those focusing specifically on identity threat. Possible wellbeing measures that could be used include happiness, life satisfaction and general resilience (e.g., Diener et al., 1985; Lyubomirsky & Lepper, 1999; Windle et al., 2011). We would expect the IRI to be positively correlated with all of these measures.

It is important to clarify the conceptual significance of identity resilience. Because of its role in determining the extent of identity threat (i.e., the extent to which the individual actually experiences psychological stress when exposed to a stimulus with the capacity to

induce stress) and the capacity to cope effectively with the stressor, identity resilience can be used primarily as a predictor or as a moderator in research into human responses to psychological adversity. A higher baseline level of identity resilience has been found to be protective against the extent of threat and a stimulant for more effective coping in the face of psychological stressors, such as being asked to think about the adverse impact of COVID-19 and coming out as a gay man to unsympathetic others (Breakwell & Jaspal, 2021a, 2021b).

With regards to measurement invariance (H3), we found that first- and second-order metric invariance were established, whereas first-order scalar invariance was only partially established, after releasing two constrained intercepts for items loading onto the distinctiveness factor. This means that mean differences in those two items may be attributable to the properties of the IRI rather than to true differences in the means of the two groups. However, it should be acknowledged that, in all cases, violations represented by observed decrease in fit indices were not extreme, and we decided to proceed with a partially constrained model to be more conservative. In fact, as indicated by Chen (2007), criteria to evaluate factorial invariance "should be used with caution, because testing measurement invariance is a very complex issue" (p. 502). Factors, such as sample size, balance in the study design and model complexity, could all significantly affect the test and evaluation of invariance. As suggested by Bollen and Long (1983), "test statistics and fit indices are very beneficial, but they are no replacement for sound judgment and substantive expertise" (p. 8). Therefore, we suggest caution in interpreting the results of non-invariance presented here and recommend that future research investigate factor invariance of the IRI in larger samples to account for the complexity of the model.

Limitations

The principal aim of this study was to develop, and describe the psychometric properties of, the IRI. In this particular study, there is limited evidence concerning the concurrent validity of the scale and future research should focus on demonstrating correlations with other relevant constructs, including other indicators of psychological wellbeing, identity threat and coping behaviors. Furthermore, we selected a higher-order solution based on evidence derived from fit indices, including the difference in AICc. Although commonly used, we must acknowledge that such indices have limitations, and therefore, the results should be considered with caution, bearing in mind that model selection is best described as a trade-off between parsimony and fit, and the factor structure of the IRI would benefit from further investigation. Data from two distinct populations – the general population and gay men - were used to examine the psychometric properties of the IRI. Moreover, the general population sample included in our study was ethnically diverse. Random subsampling was used for the analyses presented in this article. It would be beneficial to examine the performance of the scale in data collected from other populations, including using participant samples recruited in non-Internet settings. The constituent scales used to form the IRI have been drawn from studies conducted mainly in Western industrialized societies. It would be beneficial to examine the performance of the IRI in cross-cultural contexts and especially in collectivist societies in which the identity principles have been found to operate differently (Vignoles et al., 2000). For instance, it is plausible that in collectivist societies distinctiveness, operationalized in our study mainly in terms of individual distinctiveness, would operate at a collective level focusing on roles *within* groups. This should be examined in the future. Finally, our measure is distinct from extant measures of general resilience, which focus mainly on personal agency in managing stress across the life course. Future research ought to contrast the IRI with these scales to examine the additional utility of the IRI, over and beyond measures of general resilience, in explaining the successful management of psychological stress (or 'identity threat' as in IPT).

Conclusion

The 16-item IRI provides an overall measure of identity resilience with subscales for each of the four prime identity principles, namely self-esteem, self-efficacy, personal continuity and positive distinctiveness. Each of the original scales used to construct the IRI have exhibited reliability and validity across previous empirical studies, as does the IRI as a composite measure in our data. The scale focuses on the subjective perception of one's own perceived level of each identity principle, reflecting personal value; self-confidence and resourcefulness in the face of challenges; positive distinctiveness; and sense of continuity between past and present despite external change. The IRI offers a short and accessible index of one's own subjective construal of identity resilience. It will be useful for researchers modelling social, psychological and behavioral responses to adverse events and situations and for practitioners working with groups and individuals at risk of developing negative affect and identity threat.

Declaration of interests statement

The authors have no interests to declare.

Data availability statement

The data can be accessed by contacting the corresponding author.

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Appendix

Identity Resilience Index

Self-esteem

On the whole, I am satisfied with myself.
I feel I do not much have much to be proud of.*
I certainly feel useless at times.*
All in all, I am inclined to feel that I am a failure.*

Self-efficacy

I can always manage to solve difficult problems if I try hard enough.
If someone opposes me, I can find the means and ways to get what I want.
I am confident that I could deal efficiently with unexpected events.
Thanks to my resourcefulness, I know how to handle unforeseen situations.

Continuity

My past and present flow seamlessly together.
My present is a simply continuation of the past.
There is continuity between my past and present.
My past merges nicely into my present.

Distinctiveness

I feel unique
I cannot think of many special characteristics that distinguish me from others.*
I think the characteristics that make me up are different from others' characteristics.
I feel that some of my characteristics are completely unique to me.

(1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly disagree)

*reverse-scored

Table 1. Social and demographic characteristics of participants

Variables	Total (*N* = 473)	Males (*N* = 318)	Females (*N* = 154)	Non-Binary (*N* = 1)	*p*[a]
Age (years)					
M (*SD*)	33.1 (12.1)	34.1 (12.9)	31.1 (10.2)	18.0 (NA)	0.035
Ethnicity (detailed)					
N (%)					0.000
White British	324 (68.5%)	238 (74.84%)	86 (55.84%)	0 (0%)	
White and Black Caribbean	19 (4.02%)	11 (3.46%)	8 (5.19%)	0 (0%)	
White Asian	10 (2.11%)	7 (2.2%)	3 (1.95%)	0 (0%)	
White Other	2 (0.42%)	2 (0.63%)	0 (0%)	0 (0%)	
South Asian	85 (17.97%)	38 (11.95%)	46 (29.87%)	1 (100%)	
African	27 (5.71%)	16 (5.03%)	11 (7.14%)	0 (0%)	
Other	6 (1.27%)	6 (1.89%)	0 (0%)	0 (0%)	
Qualification					
N (%)					0.008
High School (GCSE/O-Levels)	59 (12.47%)	51 (16.04%)	7 (4.55%)	1 (100%)	
High School (AS/A-Levels)	114 (24.1%)	66 (20.75%)	48 (31.17%)	0 (0%)	
Undergraduate	205 (43.34%)	134 (42.14%)	71 (46.1%)	0 (0%)	
Postgraduate	87 (18.39%)	62 (19.5%)	25 (16.23%)	0 (0%)	
Apprenticeship	2 (0.42%)	1 (0.31%)	1 (0.65%)	0 (0%)	
Other	6 (1.26%)	4 (1.25%)	2 (1.3%)	0 (0%)	
Employment					
N (%)					0.081
Employed	250 (52.85%)	172 (54.09%)	78 (50.65%)	0 (0%)	
Self-employed	47 (9.94%)	37 (11.64%)	10 (6.49%)	0 (0%)	
Student	93 (19.66%)	51 (16.04%)	41 (26.62%)	1 (100%)	
Retired	21 (4.44%)	17 (5.35%)	4 (2.6%)	0 (0%)	
Unemployed	55 (11.63%)	37 (11.64%)	18 (11.69%)	0 (0%)	
Disable	4 (0.85%)	4 (1.26%)	0 (0%)	0 (0%)	
Other	3 (0.63%)	0 (0%)	3 (1.95%)	0 (0%)	

[a] Results from Kruskal-Wallis Rank Sum Test for continuous variables and χ^2 test of independence for categorical variables.

Table 2. Correlation Matrix (*N* = 465)

Items	M	SD	Skewness	Kurtosis	SS1	SS5	SS6	SS9	SF1	SF2	SF3	SF5	CN2	CN5	CN6	CN8	DS2	DS3	DS4
SS1	3.36	1.04	-0.65	-0.55															
SS5	3.48	1.17	-0.46	-0.83	0.62***														
SS6	2.75	1.27	0.45	-1	0.57***	0.62***													
SS9	3.58	1.22	-0.43	-1.02	0.67***	0.69***	0.72***												
SF1	3.89	0.78	-0.99	1.42	0.37***	0.31***	0.38***	0.37***											
SF2	3.21	0.87	-0.24	-0.19	0.24***	0.18***	0.24***	0.25***	0.41***										
SF3	3.3	0.98	-0.41	-0.59	0.44***	0.41***	0.46***	0.46***	0.48***	0.40***									
SF5	3.71	0.84	-0.79	0.66	0.37***	0.35***	0.39***	0.40***	0.50***	0.40***	0.46***								
CN2	3.18	1.14	-0.37	-0.91	0.28***	0.30***	0.28***	0.30***	0.11*	0.06	0.24***	0.18***							
CN5	2.97	1.03	-0.13	-0.91	0.27***	0.24***	0.27***	0.29***	0.17***	0.13*	0.27***	0.17***	0.55***						
CN6	2.93	1.04	0.04	-0.95	0.16***	0.17***	0.22***	0.19***	0.03	-0.02	0.13*	0.02	0.39***	0.62***					
CN8	2.99	1.05	-0.2	-1.02	0.36***	0.31***	0.33***	0.36***	0.16***	0.07	0.22***	0.17***	0.48***	0.73***	0.62***				
DS2	3.51	0.95	-0.51	-0.21	0.15***	0.19***	0.16***	0.18***	0.16***	0.24***	0.12*	0.19***	0.14*	0.01	-0.07	-0.02			
DS3	3.4	1.05	-0.34	-0.88	0.13*	0.27***	0.23***	0.23***	0.15***	0.17***	0.15***	0.25***	0.15*	0.02	0.02	0.00	0.53***		
DS4	3.47	0.87	-0.43	-0.29	0.11*	0.13*	0.12*	0.11*	0.15***	0.21***	0.20***	0.16***	0.11*	-0.03	-0.01	-0.03	0.58***	0.40***	
DS5	3.3	0.99	-0.34	-0.71	0.15***	0.17***	0.15*	0.14*	0.23***	0.19***	0.21***	0.12*	0.18***	0.05	0.03	0.01	0.51***	0.36***	0.57***

Note. All correlations are expressed as Pearson's r values *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 3. Second-order factor loadings and residualized factor loadings obtained via Schmid-Leiman transformations (*N* = 232)

Items	Second-order factor loadings	Residualized factor loadings			
		SS	SF	CN	DS
SS1	0.64	0.39			
SS5	0.68	0.41			
SS6	0.68	0.41			
SS9	0.75	0.45			
SF1	0.47		0.50		
SF2	0.32		0.34		
SF4	0.61		0.65		
SF5	0.55		0.59		
CN5	0.42			0.73	
CN6	0.37			0.65	
CN7	0.39			0.68	
CN8	0.43			0.75	
DS2	0.22				0.72
DS3	0.18				0.57
DS5	0.19				0.61
DS4	0.23				0.75

Table 4. Multi-Group Second-Order Confirmatory Factor Analysis, test of invariance (*N* = 233)

Nested Models	Population (General vs. Gay men)						
	CFI	RMSEA	SRMR	ΔCFI	ΔRMSEA	ΔSRMR	Comparison
1. Configural	0.981	0.035	0.069				
2. Metric 1st order	0.983	0.033	0.072	0.002	-0.003	0.003	2 vs.1
3. Metric 2nd order	0.983	0.033	0.078	0.000	0.000	0.006	3 vs. 2
4. Scalar 1st order	0.969	0.043	0.081	-0.014	0.010	0.003	4 vs. 3
5. Partial Scalar 1st order	0.978	0.036	0.079	0.009	-0.006	-0.002	5 vs. 3
6. Partial Scalar 2nd order	0.973	0.040	0.083	-0.004	0.003	0.004	6 vs. 5

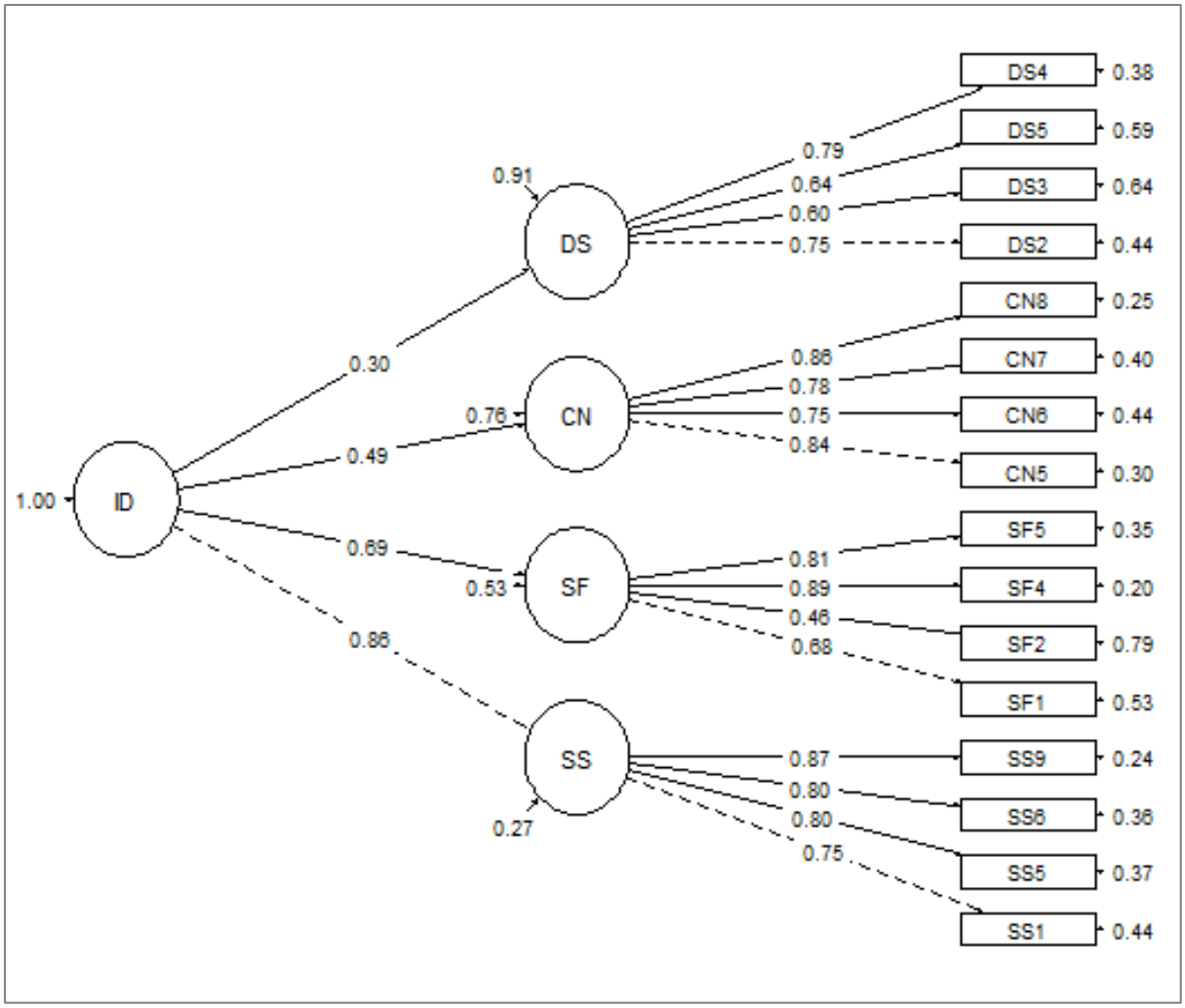

Figure 1. Second-order factor model