The structure of the Beck Hopelessness Scale: A confirmatory factor analysis in UK students

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ABSTRACT

The aim of this paper was to confirm the factor structure of the 20-item Beck Hopelessness Scale in a non-clinical population. Previous research has highlighted a lack of clarity in its construct validity with regards to this population.

Based on previous factor analytic findings from both clinical and non-clinical studies, 13 separate confirmatory factor models were specified and estimated using LISREL 8.72 to test the one, two and three-factor models.

Psychology and medical students at Queen's University, Belfast (n = 581) completed both the BHS and the Beck Depression Inventory (BDI).

All models showed reasonable fit, but only one, a four-item single-factor model demonstrated a non-significant chi-squared statistic. These four items can be used to derive a Short-Form BHS (SBHS) in which increasing scores (0–4) corresponded with increasing scores in the BDI. The four items were also drawn from all three of Beck's proposed triad, and included both positively and negatively scored items.

This study in a UK undergraduate non-clinical population suggests that the BHS best measures a one-factor model of hopelessness. It appears that a shorter four-item scale can also measure this one-factor model.

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1. Introduction

In 1974 Beck and colleagues constructed the Hopelessness Scale (BHS) as an instrument designed to quantify hopelessness (Beck, Weissman, Lester, & Trexler, 1974). Up until that point, it had been thought that hopelessness was a concept so difficult to define and measure objectively, that no meaningful scale could ever be developed. The BHS now is the most widely used measure of hopelessness (Velting, 1999). The importance of the BHS has been consistently demonstrated as a predictor of suicide ideation, suicide attempts and suicide completion (Beck, Steer, Kovacs, & Garrison, 1985; Beck et al., 1974; Chochinov, Wilson, Enns, & Lander, 1998; Dyer & Kreitman, 1984; Ellis & Ratliff, 1986). Although most research has examined the relationship between hopelessness and suicidality, the relationship between hopelessness and depression is also well established (Meites, Deveney, Steele, Holmes, & Pizzagalli, 2008).

According to Beck's (1967) cognitive model, depressed individuals view themselves as ineffective, readily internalize blame for personal problems, and see investment in the long-term future as unlikely to pay off. Hopelessness is seen at the third ingredient of this cognitive triad and, as such, is a cornerstone of his model of depression. Individuals envisage a future in which nothing will turn out right, in which failure is an inevitable consequence of any attempt to achieve goals and in which all their major problems are unsolvable (Beck, Epstein, Brown, & Steer, 1988). The result of these beliefs is a reduction in goal-striving behaviour which further perpetuates attitudinal and emotional dimensions of hopelessness.

Although hopelessness is often observed in depressive illness, and depression and hopelessness correlate very highly, it is not a necessary component of the depressive syndrome (Rooke & Birchwood, 1998). Beck et al. (1988) have shown that there is correlation between the Beck Depression Inventory (BDI) and the BHS when measuring depression (Hill, Gallagher, Thompson, & Ishida, 1988; Nekanda-Trepka, Bishop, & Blackburn, 1983; Nissim et al., 2009; Steer, Iguchi, & Platt, 1994).

The BHS is a uni-polar scale and does not conceptualize hopelessness–hopefulness on a single bi-polar scale. In addition, the BHS is a cognitive framework, representing negative state and trait expectations of the future (Glanz, Haas, & Sweeney, 1995). Low scores do not represent hope; they represent the absence of hopelessness. This lack of delineation between state or trait construct has been a point of stricture (Glanz et al., 1995). However,

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relatively high test-reliability reported in undergraduate university students (r = .85; Holden & Fekken, 1988) and in advanced cancer patients (r = .78; Mystakidou et al., 2008) suggest that it is best conceptualized as a trait based variable. Furthermore, the items tend to relate to the future, as opposed to tapping instantaneous states, strengthening the argument that it is a trait based construct. Steed (2001) has reported a strong correlation between the BHS and measures of optimism–pessimism in a normal population. The internal consistency of the scale has been reported as acceptably high (a = .93–.83) (Beck et al., 1974; Durham, 1982; Dyce, 1996; Young, Halper, Clark, Scheftner, & Fawcett, 1992) within clinical populations and slightly lower (a = .65–.88) in non-clinical samples (Chang, D'Zurilla, & Maydeu-Olivares, 1994; Durham, 1982; Steed, 2001).

Despite the predictive validity that the BHS has demonstrated there has been criticism of the measure, for example, its relationship with social desirability which may be especially prevalent in non-clinical samples (Glanz et al., 1995). However, perhaps a more fundamental question remains over the conceptual status of Beck's triad hypothesis, as there exists considerable overlap between the hypothesized mutually exclusive categories (Haaga, Dyck, & Ernst, 1991). This has prompted a number of researchers over the last 20 years to examine the factor structure of the BHS.

Within clinical populations, it has been proposed that a three-factor structure is the most appropriate (Rosenfeld, Gibson, Kramer, & Breitbart, 2004), but there has been suggestion this may be largely based on item phrasing and even within these studies, the large proportion of variance accounted for by the first factor could be seen as an argument for an uni-dimensional construct (Steed, 2001). In several studies multi-factor models provided marginally better statistical fit but additional factors explained little variance (Mystakidou et al., 2008; Young et al., 1992) and had high correlations between the factors (Chang et al., 1994; Nissim et al., 2009) or only reported acceptable fit indices (Rosenfeld, Gibson, Kramer, and Breitbart, 2004; Steed, 2001). A consensus on factor structure may have been further hampered by the variety of analysis and extraction methods employed, the use of different response formats, translations of the scale, differences between populations and, in some studies, insufficient sample size.

Aish and Wasserman (2001) studied one, two and three-factor models in 324 Swedish patients who had attempted suicide. They found that a one-factor model fitted the best, and examined a number of models using various items from the BHS. Their study showed that the number of items could be considerably reduced, and that a four-item scale showed an excellent fit.

It has been suggested that the structure of the BHS may be different for clinical and non-clinical sample (Dyce, 1996; Pompili & Tatarelli, 2007) and a simpler structure may exist in non-clinical populations, where hopelessness is not as well established (Tanaka, Sakamoto, Ono, Fujihara, & Kitamura, 1998). There have been several studies examining the factor structure of the BHS in a non-clinical population. Tanaka et al. (1998) reported two-factor solutions after conducting exploratory analyses on 508 community residents in a Japanese city. Their two factors were labelled 'doubt about a hopeful future' and 'belief about a hopeless future'. Marshall, Wortman, Kusulas, Hervig, and Vickers (1992) conducted exploratory factor analysis and confirmatory factor analysis in two samples (n = 346, n = 543) of male navy recruits. They reported that a two-factor structure, measuring optimism and pessimism, had good fit. Chang et al. (1994) conducted both exploratory and confirmatory factor analysis on the data from 389 US undergraduate students. They reported both a one and two-factor structure fitted the data well but concluded that the one-factor was more appropriate due to the large correlation (r = −.93) between the two latent factors. Steed (2001) initially conducted an exploratory factor analysis of the results of 544 undergraduate students reporting a four-factor

fit but after specifying several models with confirmatory factor analysis concluded a modified two-factor was the most appropriate model; although the fit statistics only indicated a 'reasonable fit' when four items were removed (4, 5, 8 & 13) to improve fit. In a study of 340 Italian students, Pompili and Tatarelli (2007) reported that confirmatory factor analysis did not support Beck's original three-factor structure but a subsequent exploratory factor analysis suggested a six-factor model which was subsequently reduced to a two-factor model due to insufficient items loading on factors. This model was not subjected to confirmatory analysis.

The results from these studies are far from conclusive however. For example, Chang et al. (1994), Marshall et al. (1992), Tanaka et al. (1998) and Pompili and Tatarelli (2007) all reported a two-factor structure of the BHS and interpreted this as relating to pessimism and optimism in non-clinical samples. However, the items used in each factor used in these studies bear little resemblance to each other (three or four common items per factor). This may be due to the differences in analysis, the response scale used or simply translation issues. It should be noted that in both Marshall et al.'s (1992) study and Steed's (2001) study, the analysis was based on replacing the normal dichotomous scoring of the BHS with a 5-point Likert scale. The modification of the response format in these studies may mean the results are unsuitable to be compared to findings from studies utilizing the original BHS. Marshall et al. (1992) utilised orthogonal rotation in their exploratory analyses, implying that each of the subscales should not be related. It is difficult to justify the rationale of this technique, as each of those subscales contained items that were theoretically similar. Chang et al. (1994) and Pompili and Tatarelli (2007) employed an exploratory analysis which assessed the variance in the items in a scale; interpretations are post-hoc and subjective. Furthermore, unlike alternative methods, the Principal Components Analysis (PCA) utilised in the Chang et al. (1994) study, does not attempt to eliminate error variance from the factor matrix and may be less generalisable (Kline, 1998). Additionally, the total number of responses used for the PCA was less than the recommended minimum of 200 (Kline, 1986, 2000).

There have been calls for more research to confirm the construct of hopelessness (Glanz et al., 1995) especially in non-clinical populations (Steed, 2001; Tanaka et al., 1998). In fact, the current lack of clarity prompted Rosenfeld and colleagues to state: "The factor structure and utility of the BHS in non-clinical populations is simply unknown" (Rosenfeld, Gibson, Kramer, and Breitbart, 2004 pp. 47). The aim of this study was to test the factor structure of the BHS for a non-clinical UK population. In addition to the commonly used one-factor and three-factor structures proposed by Beck and colleagues, a number of other published one-and multi-factor models were assessed. A secondary aim was to explore how depression (measured by Beck's Depression Inventory) co-varied with best fitting factor hopeless model in a non-clinical sample.

2. Method

2.1. Participants

The sample consisted of 581 undergraduate students studying psychology or medicine at Queens University Belfast. The mean age of the participants was 19.21 (SD = 3.40) and most of the students were single (97.6%) and had no dependants (97.6%).

2.2. Measures

2.2.1. Bhs

The BHS is a 20 item self-report inventory which reflects negative expectancies in the respondent (Beck & Steer, 1988).