The Controllability Beliefs Scale used with carers of people with intellectual disabilities: psychometric properties

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Abstract

Background Beliefs about the controllability of behaviour have been consistently shown to be important in understanding the responses of carers to the challenging behaviour of people with intellectual disabilities (IDs). This paper reports the reliability and validity of the Controllability Beliefs Scale (CBS), a 15-item measure of beliefs regarding the controllability of challenging behaviour when used with carers of people with IDs.

Methods Two hundred and sixty-four carers of people with IDs completed the CBS, 74 people also completed the Modified Attributional Style Questionnaire and the Self-Injury Behavioural Understanding Questionnaire scale to determine concurrent and convergent validity and 34 people completed the scale twice within a 2- to 4-week period to determine test–retest reliability.

Results The scale has a two-factor structure and has adequate internal reliable. The scale is significantly correlated with the controllability, internality and stability items from the Modified Attributional Style Questionnaire, showed expected associations with behavioural and internal emotional understanding items from the Self-Injury Behavioural Understanding Questionnaire. The scale has good test–retest reliability.

Conclusions The data support use of the CBS in clinical practice and research to assess carers’ beliefs regarding challenging behaviour of people with IDs.

Keywords attribution, carers, intellectual disability, methodology in research

Introduction

There is ongoing research interest in the processes through which beliefs, attributions and emotions affect the behavioural responses of carers working with people with intellectual disabilities (IDs) and challenging behaviour (e.g. Dagnan & Cairns 2005; Willner & Smith 2007). A number of models and theoretical approaches have been explored in this area; however, Weiner’s attribution model continues to receive attention. Weiner (2006) describes a cognitive emotional model that suggests that the attributions people make to causes of behaviour affect their emotional responses which in turn affects the
probability of particular behaviours. The model has been successfully and widely applied to a range of situations. For example, Weiner et al. (2011) describe how attributions of control and judgements of responsibility affect individual and societal responses to poverty, while Roesch & Weiner (2001) review literature that demonstrates how attributions of controllability play a significant role in how people adjust to chronic illnesses. Of particular interest to work with carers of people with learning disabilities is the application of Weiner’s model to helping behaviour and aggression; Rudolph et al. (2004) review papers from simulated and real event studies which involve a range participant groups which test the attribution model when applied to helping and aggression. Their meta-analysis suggests that judgements of responsibility and controllability determine the emotional reactions of anger and sympathy, and that these emotional reactions, in turn, directly influence help giving and aggression. The studies reviewed suggest that the attribution, emotion, helping model is equally supported for real events as it is for simulated and vignette-based data.

Weiner’s work suggests that the attribution of control of behaviour is a core human judgement. There is a tendency to assume that another person’s behaviour is under their control and that they behave intentionally (e.g. Ross 1977; Sabini et al. 2001). The attribution of control is of particular importance to people with learning disabilities. The control of behaviour that is attributed to people with learning disabilities affects many aspects of their lives from cultural judgements of blame in criminal justice systems (Talbot & Jacobson 2010) to potential interaction patterns with carers (Dagnan & Cairns 2005). Weiner’s model has been widely applied to carers of people with IDs (e.g. McGuinness & Dagnan 2001; Dagnan & Cairns 2005; Willner & Smith 2007; Armstrong & Dagnan 2011). Willner & Smith (2007) review studies that test the attribution model when applied to the attributions, emotions and behaviour of carers of people with learning disabilities and challenging behaviour. They conclude that support for the model in studies of carers of people with IDs has been inconsistent. However, their Table 1 (p. 152) lists relevant findings in column 3 and shows control to be associated with either affect, optimism or helping in nine out of the 10 studies they review; the one study they report that did not find such an association was Dagnan & Cairns (2005) which found a significant effect for responsibility, a construct closely related to controllability.

Williams et al. (2011) review the impact of challenging behaviour training on the beliefs of carers of

Table 1  Item means, standard deviations, factor structure and item-total correlations for the Controllability Beliefs Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Item-total correlations for full scale</th>
<th>Item-total correlations for Factor 1</th>
<th>Item-total correlations for Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. They are trying to wind me up</td>
<td>3.75</td>
<td>1.39</td>
<td>0.63</td>
<td>0.22</td>
<td>0.55</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>2. They can’t help themselves</td>
<td>3.29</td>
<td>1.24</td>
<td>0.03</td>
<td>0.68</td>
<td>0.24</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>3. They are doing it deliberately</td>
<td>3.49</td>
<td>1.26</td>
<td>0.71</td>
<td>0.17</td>
<td>0.61</td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td>4. They know what they are doing</td>
<td>3.12</td>
<td>1.16</td>
<td>0.68</td>
<td>0.09</td>
<td>0.30</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>5. They have no control over their behaviour</td>
<td>2.99</td>
<td>1.07</td>
<td>-0.06</td>
<td>0.64</td>
<td>0.46</td>
<td>0.37</td>
<td></td>
</tr>
<tr>
<td>6. They could stop if they wanted</td>
<td>3.35</td>
<td>1.10</td>
<td>0.73</td>
<td>0.12</td>
<td>0.60</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>7. They are trying to manipulate the situation</td>
<td>3.24</td>
<td>1.30</td>
<td>0.73</td>
<td>0.02</td>
<td>0.54</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>8. They can think through their actions</td>
<td>3.27</td>
<td>1.27</td>
<td>0.66</td>
<td>0.02</td>
<td>0.48</td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>9. They don’t mean to upset people</td>
<td>3.45</td>
<td>1.24</td>
<td>0.23</td>
<td>0.64</td>
<td>0.37</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>10. They are in control of their behaviour</td>
<td>3.44</td>
<td>1.12</td>
<td>0.67</td>
<td>0.23</td>
<td>0.61</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>11. They mean to make me feel bad</td>
<td>3.89</td>
<td>1.48</td>
<td>0.73</td>
<td>0.34</td>
<td>0.43</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>12. They have chosen to behave in this way</td>
<td>3.62</td>
<td>1.31</td>
<td>0.68</td>
<td>0.30</td>
<td>0.64</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>13. They are not to blame for what they do</td>
<td>3.20</td>
<td>1.38</td>
<td>0.01</td>
<td>0.67</td>
<td>0.26</td>
<td>0.41</td>
<td></td>
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<tr>
<td>14. They know the best time to challenge</td>
<td>3.07</td>
<td>1.31</td>
<td>0.62</td>
<td>-0.02</td>
<td>0.45</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>15. They don’t realise how it makes me feel</td>
<td>3.82</td>
<td>1.36</td>
<td>0.19</td>
<td>0.58</td>
<td>0.36</td>
<td>0.38</td>
<td></td>
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</table>
people with IDs and describe a small number of measures that have been used in this type of research. One of these scales is the Controllability Beliefs Scale (CBS; Dagnan et al. 2004). The CBS was developed using the ‘natural language’ statements to measure the attribution dimension control in response to challenging behaviour. The psychometric properties of the scale have been reported for carers of older people (Dagnan et al. 2004). The scale has been used in a number of studies of people with IDs. For example, Kalsy et al. (2007) show the scale to be sensitive to change in a study evaluating training on dementia for carers of people with IDs. Phillips & Rose (2010) report that judgements of control of challenging behaviour measured using the CBS are significant predictors of placement breakdown for people with challenging behaviour. Dilworth et al. (2011) used the CBS to demonstrate that attributions of control were lower for staff who worked in higher quality organisations and in environments that were delivering well-structured care.

This paper reports psychometric properties of the CBS in a population of carers on people with ID. The study uses two other scales for concurrent and convergent validity. For convergent validity we use the Self-Injury Behavioural Understanding Questionnaire (SIBUQ; Oliver et al. 1996). The SIBUQ assesses not only causal explanations of the determinants self-injurious behaviour (including behavioural and emotional dimensions) but also technical and procedural knowledge and the carer’s likely response to the behaviour. Some of the sub-scales in this measure are derived in a way that means they are mutually exclusive and so are inevitably negatively correlated with each other. In this study we use the ‘total behavioural correct’ scale which identifies how well participants agree with behavioural and the ‘internal emotional’ sub-scale which identifies whether participants tend to explain self-injurious behaviour in terms of internal emotional factors. Based upon previous studies using this scale (e.g. Dagnan 2012) and previous associations of controllability with internal and emotional explanations (e.g. Dagnan & Cairns 2005) we predict that controllability beliefs measured using the CBS will be negatively correlated with the ‘total behavioural correct’ scale and positively correlated with the ‘internal emotional’ sub-scale. This study also uses the Modified Attributional Style Questionnaire (MASQ; Peterson et al. 1982) as used by Dagnan et al. (1998) and McGuinness & Dagnan (2001). This scale requires participants to attribute controllability, internality and stability to a perceived cause for a stated behaviour (in this study an aggressive behaviour). The association of the CBS with the controllability item from the MASQ serves as a measure of concurrent validity and we predict that the association will be positive, the attributions of internality and stability will serve as convergent validity and we would predict from previous studies using the MASQ that the CBS will be positively associated with internality but make no specific predictions for stability.

**Methods**

The data in this paper are from two populations. The first population is from an evaluation of staff training which provided 194 participants, from which the pre-training completion of the scale is used. The second population is from an independent sector organisation and NHS trust where data were collected in a postal survey from 74 people for the purposes of concurrent and convergent validity and test–retest reliability; all 74 participants were then sent the CBS again for test–retest purposes 2 weeks after their first completion of whom 38 people returned the scale within 4 weeks of their first completion. Data collection in both populations had appropriate NHS or educational ethics approval. Differences in the core demographic data and in scores on the CBS were examined between the two populations; no differences were found to be statistically significant so the data are presented as a single data set.

**Participants**

Two hundred and sixty-eight carers of people with learning disabilities whose roles included direct care completed all CBS scale items and all demographic data; 182 were women (67.9%) and 86 were men (32.1%). An ethical requirement for one of the studies was to collect age and experience data as a categorical variable; the 43 (16.0%) of the group...
were 25 years and under; 77 (28.6%) were 26–35 years; 80 (29.9%) were 36–45 years and 82 (30.6%) were 46 years and over; 117 (43.5%) of the group have 1–5 years experience; 28 (10.6%) have 6–10 years; 44 (16.5%) have 11–15 years; 32 (11.8%) have 16–20 years and 47 (17.6%) have more than 20 years experience.

**Measures**

1. The CBS (Dagnan et al. 2004) is a 15-item measure developed for use with carers of people with challenging behaviour; the scale is presented to carers as described in Dagnan et al. (2004). The scale is scored on a 1- to 5-point scale with anchored ratings of ‘agree strongly’, ‘agree slightly’, ‘unsure’, ‘disagree slightly’ and ‘disagree strongly’. Ten of the scale items are worded such that agreement indicates a perception of high control (for example, item 5, ‘They know what they are doing’); five items are worded such that agreement indicates a perception of low control (for example, item 9, ‘They don’t mean to upset people’). The five low control items are reversed scored so that a higher score on every item indicates endorsement of beliefs of control. Dagnan et al. (2004) report the psychometric properties of the scale when used with carers of older people; the scale had a two-factor structure suggesting high and low attributions of control, and had acceptable internal reliability (alpha for total score = 0.89; alpha for negative sub-scale = 0.92, alpha for positive sub-scale = 0.73).

2. The MASQ (Peterson et al. 1982) as used in previous studies (e.g. Dagnan & Cairns 2005) of attribution of carers was used with 74 participants to allow concurrent and convergent validity to be reported. Carers were asked to report what they considered to be the most likely reason for a vignette describing aggressive behaviour, ‘A person with a learning disability/named person hits you or pulls your hair’, and to rate this reason on 7-point Likert scales according to the attribution dimensions of internality, stability and controllability. A higher score on these scales indicates greater level of the named attribution. It would be expected that the CBS would correlate positively with the control sub-scale of the MASQ, and controllability has previously been shown to correlate with internal judgements (e.g. Dagnan & Cairns 2005; Armstrong & Dagnan 2011). The association of control as measured by the CBS and stability is less easily predicted.

3. The SIBUQ (Oliver et al. 1996) was completed by 74 participants to allow convergent validity to be reported. This is a 27-item multiple-response questionnaire that identifies the explanations of support staff in respect to self-injurious behaviour. The questionnaire consists of three sub-scales, namely knowledge, action and causal explanations. As the sub-scales of this questionnaire are mutually exclusive such that some scales are inevitably inversely related this paper reports only the ‘total behavioural correct’ and ‘internal emotional explanation’ sub-scales. Control attributions from the MASQ have been shown to be inversely correlated with the ‘total behavioural correct’ sub-scale (Dagnan 2012) and positively associated with higher levels of emotional response (e.g. Dagnan & Cairns 2005).

**Results**

Table 1 shows item means, standard deviations for the CBS. Principal components factor analysis with a varimax rotation was carried out on scale items (see Table 1). The Kaiser–Meyer–Olkin statistic was 0.84 and Bartlett’s Test of Sphericity was significant (approximate chi-squared 1295.4, d.f. = 105, \( P < 0.001 \)), suggesting a data set suitable for factor analysis. Factor 1 had an eigenvalue of 4.81, and accounted for 32.4% of the variance; factor 2 had an eigenvalue of 1.8 and accounted for 12.1% of the variance; factor 3 had an eigenvalue of 1.4 and accounted for 9.6%; factor 4 had an eigenvalue of 1.1 and accounted for 7.2% and factor 5 had an eigenvalue of 0.8 and accounted for 5.3%. Although four factors have eigenvalues above 1 and accounted for more than 10% of the variance an examination of the scree plot suggested either a two- or four-factor structure to the scale. The two-factor solution placed items into factors such that no item has a communality of less than 0.4 for the factor that it is in (Floyd & Widaman 1995; Costello & Osborne 2005). Examination of the solutions suggested that the two-factor solution is the same as the solution reported by Dagnan et al. (2004); therefore, a two-factor solution is suggested for the scale in this paper. Table 1 shows the factor loadings for the CBS.
Table 2. Bivariate correlations for the Controllability Beliefs Scale (CBS) total, and low and high control sub-scales with the Self-Injury Behavioural Understanding Questionnaire (SIBUQ) ‘total behavioural correct’ and ‘internal emotional’ sub-scale and the Attributional Style Questionnaire (MASQ) internal, stable and controllable items

<table>
<thead>
<tr>
<th>SIBUQ</th>
<th>MASQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBS</td>
<td></td>
</tr>
<tr>
<td>Behavioural correct</td>
<td>Internal emotional</td>
</tr>
<tr>
<td>Total scale</td>
<td>-0.25</td>
</tr>
<tr>
<td>High control sub-scale</td>
<td>-0.26</td>
</tr>
<tr>
<td>Low control sub-scale</td>
<td>-0.24</td>
</tr>
</tbody>
</table>

*Italic = P < 0.01, Underline = P < 0.05.*

The CBS has a Cronbach’s alpha of 0.89, the negative sub-scale has an alpha of 0.85 and the positive sub-scale an alpha of 0.64; Table 1 shows the corrected item-total correlations for the CBS; full scale had a mean corrected item-total correlation of 0.45 (range 0.26–0.61). Table 1 also shows the corrected item-total correlations for the two sub-scales suggested by the factor analysis. The total scores for the CBS were normally distributed for both full scale and sub-scale scores: The full scale score for the group was 51.00 (SD = 10.35; range 20–75); a Kolmogorov–Smirnov test was non-significant (Z = 0.99; ns). The score for the negative sub-scale was 34.27 (SD = 8.40; range 12–50); a Kolmogorov–Smirnov test was non-significant (Z = 1.22; ns). The score for the positive sub-scale was 16.68 (SD = 3.97; range 6–25); a Kolmogorov–Smirnov test was non-significant (Z = 1.03; ns). There was no significant difference in the full or sub-scale scores for the CBS between men and women (t = −0.05, d.f. = 266, ns) and no differences were found in the groups based upon age (Fr,264 = 0.49, ns) or experience (Fr,263 = 0.74, ns).

The CBS was predicted to correlate negatively with the ‘total behavioural correct’ sub-scale and positively with the ‘internal emotional’ sub-scale of the SIBUQ (Oliver et al. 1996) and to correlate positively with the MASQ items for controllability and internality. Seventy-four people who completed the CBS also completed the SIBUQ and the MASQ. This group have mean scores for the ‘total behavioural correct’ sub-scale of 2.68 (SD = 2.18), for internal emotional explanation of 3.36 (SD = 2.96), a mean score for the controllability item of the MASQ of 3.4 (SD = 1.4), a mean score of internality item of the MASQ of 4.2 (SD = 1.4) and a mean score for the stability item of the MASQ of 3.6 (SD = 1.6). The bivariate correlations between the CBS and the two sub-scales of the SIBUQ and the attribution dimensions of the MASQ are shown in Table 2.

Finally the CBS was completed by 38 people twice within a 2- to 4-week period; the test–retest reliability of the full scale (r = 0.87, P < 0.001), the negative sub-scale (r = 0.93, P < 0.001) and the positive sub-scale (r = 0.75, P < 0.001) were high.

**Discussion**

Williams et al. (2011) suggest that the measurement of attribution is inconsistent and not all scales used in the area have well-established psychometric properties. This paper has reported the psychometric properties of the CBS. The scale has a two-factor structure representing low and high control beliefs, has acceptable internal reliability and has good levels of test–retest reliability. The full scale and sub-scale scores correlate in a predictable manner with behaviourally correct and internal emotional explanations of challenging behaviour and with the single item attribution measures of controllability, internality and stability from the MASQ, although the positive sub-scale tends to have weaker relationships with other measures.

The factor structure of the scale suggests the same two-factor structure to that reported by Dagnan et al. (2004). The two factors are easily identified as low and high attributions of control. It is possible that this is an artefact of question
wording. However, a number of other cognitive scales (for example, self-esteem scales; Andrews 1998; Dagnan & Sandhu 1999) also give factor structures that suggest positive and negative beliefs about the same construct are relatively independent. In the current study there are slight differences in the pattern of correlations for the two-factor-derived sub-scales, a finding also reported by Dagnan et al. (2004). Future research with the scale should examine the correlates of both sub-scales in order to further develop understanding of whether particular styles of thinking about challenging behaviour are related to particular carer responses. However, as the internal reliability of the low control sub-scale is relatively poor and reduces the overall internal reliability. The 10-item high control sub-scale has generally good internal reliability at a level that may be sufficient to examine changes in beliefs at an individual level as well as at a group levels; thus it may be better used as a single scale in future clinical and research work (Tavakol & Dennick 2011).

The CBS correlates positively with the emotional explanation sub-scale and negatively with the behaviourally correct explanation sub-scale of the SIBUQ. This is a predictable relationship, supported by previous research (e.g. Dagnan 2012), suggesting that controllability judgements are more likely to be associated with emotionally based explanations of behaviour than with explanations based upon knowledge of behavioural theory. These relationships may be regarded as particularly robust given that the CBS was used in this study to assess controllability beliefs about challenging behaviour in general whereas the SIBUQ assesses understanding of self-injurious behaviour. This suggests that the CBS is assessing a broad controllability judgement that also affects attributions of specific behaviours. Similarly the CBS correlates as would be expected with the single control and internality attribution questions of the MASQ. The correlations are again only moderate in size; however, the CBS asks participants to rate control statements with respect to non-specific ‘challenging behaviour’ whereas the MASQ was rated with respect to a simple scenario describing aggressive behaviour; it is probable that the correlations would have been higher if the ratings had both been about the same behaviour or scenario. Finally the CBS does not correlate well with the stability question of the MASQ, while attributions of control will almost inevitably be associated with attributions of internality some controllability based explanations will not be seen as stable (for example, challenging behaviour may be seen as less controllable if a person is known to be tired).

The attribution of control has been suggested as important in determining many aspects of organisational and individual response to challenging behaviour (e.g. Phillips & Rose 2010; Armstrong & Dagnan 2011). In previous studies the scale has been shown to be sensitive to change in training (Kalsy et al. 2007) and to relate to organisational factors important in managing challenging behaviour (Phillips & Rose 2010; Dilworth et al. 2011). We suggest that the CBS is psychometrically robust and is thus a useful scale for clinical and research work concerning the attribution of carers of people with IDs.

References


Accepted 27 February 2012