

An exploratory factor analysis and construct validity of the Resident Choice Assessment Scale with caregivers of adults with intellectual disabilities and challenging behaviour in community settings.

Short title: EFA of The Resident Choice Assessment Scale in community settings.

Keywords: intellectual disabilities, challenging behaviour, choice, community

Abstract

Introduction: The Resident Choice Assessment Scale (RCAS) (Kearney, Durand, & Mindell, 1995) is used to assess choice availability for adults with intellectual disabilities (ID). The aim of the study was to evaluate the psychometric qualities of the RCAS in community settings. The study explored the factor structure, construct validity and internal consistency of the measure to further validate this tool.

Method: The study was part of a larger multi-centre randomised controlled trial investigating the effectiveness of Positive Behaviour Support for the reduction of challenging behaviour in adults with ID (Hassiotis et al., 2014). 108 paid carers of adults with ID living in supported accommodation and residential care facilities in urban, rural and semi-rural areas in England completed the RCAS. Exploratory factor analyses were performed and the construct validity and internal consistency of the emerging factors were assessed.

Results: Principal Axis Factoring with oblique rotations suggested a scale with two factors (*everyday choices* and *participation in household activities*) which explained 45% of the variance; the factors showed favourable construct validity as they identified significant differences between those living in residential care homes compared with supported living; the factors also differentiated between people with different levels of intellectual impairment with less choice and participation in domestic activities for those with more severe ID compared to their counterparts with moderate and mild impairment. Five items did not load onto any factor suggesting that these could be dropped from the scale when administered in community settings, thus resulting in an 18-item measure (RCAS-18).

Conclusion: The RCAS-18 may provide a useful measure to assess choice availability for people with ID supported by paid carers in the community. The revised measure may be more suitable in capturing choice than the original version for use in community samples.

Background

Choice has been regarded alongside rights, inclusion and independence as one of the quality of life domains which should guide policy and practice for people with intellectual disabilities (ID) (Beadle-Brown, 2006). In the UK *Valuing People Now* (DOH, 2009) emphasised that the provision of more opportunity for choice and autonomy is one of the primary policy objectives of the transformation strategy of care services for this population group, which has the scope to significantly improve the lives of people with ID so that they become comparable to those of ordinary people. Similarly in Australia choice embodies one of the core principles of the 2010-2020 National Disability Strategy which is a ten year plan to enhance the lives of people with disabilities, their families and carers, (COAG, 2011). The opportunity to make choices should be a right for every human being and it should be an essential part of everyone's life, with choice-making being considered a crucial dimension of quality of life (Kearney et al., 1995).

Previous research has shown that in people with ID the opportunity for choice-making is largely related to their level of disability and adaptive behaviour, with people with milder intellectual impairment being consistently given more choice opportunities compared to people with more severe ID (Lakin et al., 2008; Robertson et al., 2001, Ticha et al., 2012). Those with greater communication ability are more heavily involved in decision making whereas those with limited or lacking verbal skills are often excluded from having input on decisions affecting their life, and many decisions affecting their daily living are made *for* them (Ticha et al., 2012). Previous research has however shown that given the right context and right support, even people with more severe ID are capable of making choices and communicating their preferences (Kern et al., 1998). Systematic preference assessment

provides an example of an approach which may be used to identify choices and preferences among individuals with communications impairments (Reid, Everson, & Green, 1999).

It has been argued that as a consequence of the process of deinstitutionalisation and the move to community based settings, in general, there has been an increase in the opportunities for people with ID to exercise more control over their lives and make choices (Wehmeyer & Bolding, 1999). Research suggests that individuals living in smaller community homes typically enjoy more choice than residents in segregated environments, with those living in homes with fewer residents and greater focus on individualisation exercising the greatest levels of choice (Emerson et al., 2001; Stancliffe, 2001; Stancliffe & Parmenter, 1999). Wehmeyer and Bolding (1999) found that people living in non-congregate settings had more opportunities for choice and autonomy than their peers in congregate settings. Participants in the study were matched by IQ thus minimising the impact of personal characteristics on the observed differences. The authors concluded that there may be certain characteristics within different living environments which may be more conducive to choice-making as differences were observed even when controlling for variables such as intellectual functioning.

In the last few decades a number of instruments to measure choice availability for people with ID in different living environments have been developed (Hatton et al., 2004; Kishi, Teelucksingh, Zollers, Park-Lee, & Meyer, 1988; Shalock & Keith, 1993; Stancliffe & Parmenter, 1999); one such example is the Resident Choice Assessment Scale (RCAS)(Kearney et al., 1995) which was developed to measure choice availability for people with ID living in various residential settings, including larger institutions. Differently from measures which may be more suitable for administration by interview (Hatton et al., 2004; Stancliffe & Parmenter, 1999) the RCAS can be self-completed by direct-care staff and covers aspects of choice surrounding various every day activities. The measure has demonstrated acceptable psychometric properties.

The two decades following the introduction of the scale however have seen a changing landscape for the provision of care for people with ID, with the closure of large institutions and the move to community settings. In countries such as the United Kingdom (UK), United States (US), Australia and Sweden ordinary housing in the community is now widely advocated as the best model of support for people with ID. In the US the Developmental Disabilities Assistance Bill of Rights Act (DD Act) has been influential to the advent of community-based supports and in the UK the Government has been committed to ensuring that the number of people in large scale residential care is dramatically reduced and that no one is inappropriately living in a hospital setting (Department of Health, 2007, 2012). The rationale underpinning this shift in the provision of care for people with ID is the promotion of a better quality of life and better outcomes, which are thought to be better achieved in smaller community supported living services (DOH, 2001; Emerson et al., 2001). Since nowadays the majority of people with ID in countries such as the UK and USA reside in the community, the RCAS in its original form may not be suited to the current context as some of its items which reflect past practices in congregate settings may not be relevant in community living in the present day.

The aim of the present study was to evaluate the RCAS in community living environments. The factor structure and the construct validity and internal consistency of the emerging factors were explored.

Method

This study was part of a large multi-centre randomised controlled trial investigating the clinical and cost effectiveness of professional staff delivered Positive Behaviour Support (PBS) to reduce challenging behaviour in adults with ID living in the community. Detailed methodology for the trial is reported elsewhere (Hassiotis et al., 2014). Paid carers of service-users taking part in the PBS study who contributed to study data were approached

and invited to complete a self-administered questionnaire on choice availability in the accommodation establishments they worked in.

Participants and settings

A cohort of 133 paid carers of people with ID already participating in the Positive Behaviour Support (PBS) from several regions in England covering urban, semi-rural and rural areas were invited to take part. The carers supported adults with ID living in the community including residential care homes and supported living arrangements typically accommodating between 1 and 10 people in ordinary housing. Carers were excluded if they did not take part in any of the previous PBS study assessments.

Instruments

Resident Choice Assessment Scale (Kearney et al., 1995). The instrument is a staff-based measure of choice availability for people with ID. The original RCAS included 25 items each rated on a Likert-type scale ranging from 1 (never) to 7 (always) with possible scores ranging from 25 to 175 (higher scores indicate higher choice availability). Items relate to choices surrounding every day events such as meals and activities. Carers completing the measure are instructed that it is a measure to assess levels of available choice in an individual's living environment and not his/her capacity, or lack thereof, to make choices.

The RCAS has demonstrated significant test-retest reliability (0.91), inter-rater reliability (0.84) and favourable construct validity as it was able to differentiate between large, more restrictive (e.g. developmental centres and nursing homes) and smaller, less restrictive living environments (e.g. group homes) with significantly lower scores in the former settings (Kearney, Cook, Chapman, & Bensaheb, 2006; Kearney et al., 1995). Examination of its factor structure was examined in a sample of participants living in a developmental centre (100 beds), three nursing homes (99-270 beds) and intermediate care/foster facilities with six or fewer beds (see Kearney, Bergan, & McKnight, 1998 for sample details). The analyses

led to mixed findings: principal components analysis of the RCAS was suggestive of one- and two-factor solutions, but confirmatory factor analysis (CFA) did not support a two-factor model. The supported solution was given by a model comprising a single factor constituted by five items which it was suggested, could be used as a short choice measure (Kearney et al., 2006).

For the purpose of the present study the full version of the scale was administered but two of the original items were deleted and substituted with one that would combine both. The two original items were 'Does the client choose his/her own activities at day treatment' and 'Does the client choose his/her own recreational activities?'; the new item which replaced them was 'Does the client choose his/her own activities during the day?'. This decision was made because the questionnaires were administered to paid carers working in the homes of people with ID, who would not necessarily be aware of the support received outside the home on behalf of other agencies, and thus may have not been able provide accurate answers for questions regarding such activities. The new item asked about activities in general *during the day*, to distinguish it from another item pertaining to activities in the evening.

Statistical Analysis

R 3.1.3. was used to run the data analysis. Firstly data screening and item-analyses were conducted to assess the suitability of the items. As suggested by Tabachnick and Fidell (2001) variables with a large number of missing values (greater than 50%) were inspected and if not considered critical for the analysis they were removed; non-discriminatory items (those for which 80% or more of respondents answered the same) were also removed. Missing item-level values, which were limited, were imputed with the Expected-Maximisation (EM) algorithm.

Principal Axis Factoring (PAF) (which does not assume normally distributed variables) with an oblique rotation (Direct Oblimin) which assumes factors are correlated (Field, 2005) was conducted with the remaining items and the factor structure was explored. Factorability was assessed with both the Kaiser-Meyer-Olkin Index (KMO) test and Bartlett's test of sphericity. The Diagonal of the anti-correlation matrix was also inspected for any values smaller than 0.5. Kaiser's criteria (retention of factors with eigenvalues >1) combined with visual inspection of the scree plots was used to determine the optimal number of factors from the factor analysis. Only items with factor loadings greater than 0.4 were considered for inclusion in each factor (Field, 2005).

Construct validity for each resulting factor was explored by assessing whether the measure would show significant differences across types of accommodation and level of ID of the person supported by the carers completing the questionnaire. Shapiro-Wilk's test of normality and Levene's test of homogeneity of variance were conducted in order to assess the suitability of parametric statistical analyses (ANOVA) to explore the differences between the groups. Where the assumption of normality was not met the non-parametric Kruskal-Wallis H test was performed to explore differences between groups with equal variances. Where in addition to the assumption of normality the assumption of homogeneity of variance was also violated an ANOVA with Welch's correction was applied. The test has been shown to be robust when variances between groups are unequal and it is accurate even with non-normal data when there are at least 15 cases per group if there are 2-9 groups (Frost, 2014). Post-hoc pairwise comparisons with Bonferroni corrections were performed to elucidate any significant differences across the groups. The factors' internal consistency was determined by calculating Cronbach's alpha.

Results

108 paid carers (81% response rate) completed the questionnaires. The paid carers' demographics are presented in table 1. The service-users in the care of the respondents

were individuals with mild to severe ID (determined by the WASI; Wechsler, 1999) and challenging behaviour (screening score of 15 or more on the Aberrant Behaviour Checklist; Aman, Singh, Stewart, & Field, 1985). Service users' characteristics are presented in table 2.

Table 1. Paid carers' demographics

Age (Mean, SD)	43.32 (13.05)
Males N(%)	36 (33.3)
Education N(%)	
GCSE*	17 (15.7)
O/A-levels**	47 (43.5)
Degree/Higher Education	33 (30.50)
Other/Missing	11 (10.2)
Years experience working with people with ID (Mean, SD)	10.60 (7.6)

*General Certificate of Secondary Education (an examination set especially for secondary-school pupils of about age 16 in England, Wales, and Northern Ireland).

**Ordinary/Advanced level of the General Certificate of Education awarded in England, Wales and Northern Ireland, typically required for admissions to college/university.

Table 2. Service-users' demographics

Age (Mean, SD)	43.9 (14.5)
Adaptive Behaviour (SABS)* (Mean, SD)	50.72(23.06)
Challenging Behaviour (ABC) (Mean, SD)	61.80 (26.29)
Males N(%)	73 (67.6)
Intellectual impairment N(%)	
Mild	12 (11.1)
Moderate	46 (42.6)
Severe	50 (46.3)
Mobility impairment N(%)	19 (17.6)
Autism N(%)**	18 (16.7%)
Severe Mental Illness (anxiety/depression/OCD) N(%)**	48 (44.4%)
Mania/Psychosis N(%)**	20 (18.5)
Residential Setting N(%)	
Residential Care Home	56 (51.9)
Group Supported Living (24-hours)	30 (27.8)
Individual Supported Living (24-hours)	22 (20.4)

*Short Adaptive Behaviour Scale (Hatton et al., 2001)

** Assessed with the mini version of the Psychopathology Assessment Scale for Adults with Developmental Disability (mini PASADD) (Prosser et al., 1998)

Item analysis

None of the items had more than 80% of people respond in the same manner and therefore all were retained for further analyses.

Deletion of variables with more than 50% missing data

The variable “Does the client choose his roommate?” was left blank by 63% of respondents. None of the residents in the present sample shared a room with anyone else and it is typical nowadays for people with ID who live in shared supported housing or in residential facilities in the community to have their own bedroom. The variable was therefore not considered appropriate for the analysis and it was thus removed from the dataset.

Missing items

After removing the previously mentioned variable there were 45 missing values out of a total of 2484 possible responses (1.81%). Forty of those values were from one variable (“Does the client choose which type of adaptive equipment or prosthetic device to use?”) which was left blank by 37% of respondents.

Exploratory Factor Analysis

The Kaiser–Meyer–Olkin Index of sampling adequacy value ($KMO = 0.851$) verified the sampling adequacy for the proposed analysis (Field, 2005); Bartlett’s test of sphericity was significant (approximate Chi-square = 1514.45; $p < .001$) and the diagonals in the anti-image matrix were all above .50.

A Principal Axis Factoring with an oblique rotation yielded a five factor structure with eigenvalues above 1; visual inspection of the scree plot however suggested a solution with a lower number of factors. Solutions with four, three and two factors were explored and the simplest structure was obtained with two factors. Factor 1 which was labelled *everyday choices* had an eigenvalue of 9.293 and it explained 31% of the variance. This factor had 13 items with loadings ranging from 0.54 to 0.94. Factor 2 had an Eigenvalue of 2.052 and it explained 14% of the variance. The factor was labelled *participation in household activities*

and it had five items with factor loadings ranging from 0.45 to 0.76. The two factors cumulatively explained 45% of the variance and their correlation coefficient was 0.46. Four items ('Is the client's door locked at night?', 'May the client take walks outside by him/herself?', 'Is the client allowed to be in his/her room alone during the evening?' and 'Is the client allowed to move around the home/building as he/she wishes?') had communalities below the 0.2 cut-off point suggested by Gie Yong and Pearce (2013) and they did not load onto any factor. An additional item 'Does the client choose whether he/she receives therapy sessions?' did not load onto any factor although its communality was greater than 0.2. Table 3 shows the factor pattern matrix for this solution with respective communalities. Bootstrapped confidence intervals for each factor loadings are presented. Numbers in bold represent primary factor loadings.

Table 3. Factor loadings pattern matrix and communalities

Item	Factor 1 <i>Everyday Choices</i>	Bootstrapped CI	Factor 2 <i>Participation in household activities</i>	Bootstrapped CI	Communality
Does the client choose the time he/she brushes his/her teeth?	0.94	0.58-1.24	-0.15	-0.59-0.47	0.77
Does the client choose the time he/she takes a bath/shower?	0.89	0.57-1.15	-0.12	-0.53-0.41	0.69
Does the client choose the time he/she wakes up in the morning?	0.74	0.46-0.96	-0.23	-0.62-0.26	0.44
Does the client choose his/her bedtime?	0.68	0.42-0.91	0.00	-0.32-0.43	0.46
Does the client choose his/her own activities during the day?	0.68	0.24-1.16	0.21	-0.23-0.87	0.63
Does the client choose his/her own clothes in the morning?	0.66	0.24-1.12	0.20	-0.18-0.76	0.59
For group activities, does the client chose whether or not he/she participates?	0.63	0.41-0.88	0.05	-0.27-0.43	0.42

Item	Factor 1 <i>Everyday Choices</i>	Bootstrapped CI	Factor 2 <i>Participation in household activities</i>	Bootstrapped CI	Communality
Does the client have a choice as to whether he/she has visitors?	0.62	0.30-0.93	0.00	-0.39-0.55	0.38
Does the client choose what activities he/she will participate in during the weekend?	0.61	0.20-1.11	0.32	-0.05-0.87	0.65
Does the client choose which tv program he/she would like to watch?	0.58	0.12-1.07	0.28	-0.16-0.98	0.56
Does the client have a choice at mealtimes (e.g. ham vs.steak)?	0.58	0.21-1.02	0.25	-0.12-0.74	0.53
Does the client have a choice as to when he/she eats (e.g. 6.00 or 6.30) ?	0.57	0.11-1.03	0.14	-0.31-0.80	0.41
Does the client have a choice what radio program he/she would like to listen to?	0.54	0.09-1.05	0.37	-0.05-0.37	0.61
Is the client allowed to be in his/her room alone during the evening?	0.39	0.14-0.60	-0.13	-0.40-0.16	0.12
Is the client allowed to move around the building/home as he/she wishes?	0.32	0.03-0.64	0.17	-0.13-0.51	0.18
May the client take walks outside by him/herself?	0.28	0.05-0.54	0.08	-0.24-0.48	0.10
Does the client participate in the clean up after meals?	-0.02	-0.39-0.54	0.76	0.53-1.07	0.56
Does the client participate in doing his/her laundry?	-0.02	-0.38-0.54	0.74	0.40-1.07	0.54
Is the client responsible for all or part of the clean-up of his/her bedroom?	0.06	-0.27-0.61	0.68	0.35-1.01	0.51
Does the client choose which type of style or prosthetic devise he/she utilises (e.g. wheelchair, braces)?	0.34	-0.02-0.79	0.45	0.05-0.96	0.45

Item	Factor 1 <i>Everyday Choices</i>	Bootstrapped CI	Factor 2 <i>Participation in household activities</i>	Bootstrapped CI	Communality
Does the client participate in the preparation of meals?	0.06	-0.18-0.42	0.45	0.15-0.95	0.23
Does the client choose whether he/she will receive therapy sessions (e.g. speech, language, occupational, music)?	0.39	0.06-0.82	0.38	0.00-0.82	0.42
Is the client's bedroom door locked at night?	0.09	-0.09-0.26	0.10	-0.15-0.44	0.02

A further EFA with the same methodology which omitted the non-loading items resulted in the same factor structure. The factors cumulatively explained 53% of the variance (the factor pattern matrix is reported in Appendix A).

Construct validity

Construct validity was assessed by investigating whether the factors would identify different levels of choice availability and participation in household activities across different living environment and across people with different levels of intellectual impairment. The results are presented in the following sections.

Shapiro Wilk's test of normality showed that both factors were not normally distributed and thus not suitable for parametric analyses (see Appendix B).

1. Residential settings.

Levene's test of homogeneity of variance revealed that there were no significant differences between the variances of each factor in the different accommodation types (see Appendix B for all homogeneity of variance tests). The Kruskal-Wallis H test indicated that for both Factor 1 ($H(2)=9.58$, $p=0.008$) and Factor 2 ($H(2)=9.58$, $p=0.008$) there were significant differences across the different accommodation types; these differences were subsequently explored via pairwise comparisons. The Bonferroni adjustment was used to counteract the

problem of multiple comparisons (three for each factor) and the significance level was therefore set at $p=0.016$. Mann-Whitney U tests revealed that scores on both factors were significantly different for people living in group supported living compared to those living in residential care homes, with carers providing the most choice and participation in household activities in group supported living and the least in residential care homes (Factor 1: $U=513.50$, $p=0.003$; Factor 2: $U= 538.50$, $p = 0.006$). None of the other comparisons were statistically significant. The factors' mean scores are presented in table 4, with higher scores indicating greater choice and participation in activities.

Table 4. Factor 1 and Factor 2 scores across residential settings and level of ID

	Factor 1 Mean (SD)	Factor 2 Mean (SD)
Residential Setting		
Supported Living - Individual	79.22 (13.87)	24.41 (7.49)
Supported Living – Group	82.38 (12.97)	26.00 (7.60)
Residential Care Home	73.55 (17.26)	21.01 (9.59)
Intellectual Impairment		
Mild	83.96 (8.13)	26.56 (7.45)
Moderate	81.65 (11.27)	25.23 (9.35)
Severe	71.40 (18.82)	20.29 (8.02)

2. Levels of ID of care-recipients.

A Homogeneity of variance test indicated that the group variances for Factor 1 across the different levels of ID were significantly different and therefore differences between the groups were tested with a One Way ANOVA with Welch's correction. The test revealed a significant difference between the groups ($F(2,105)= 7.01$, $p = 0.002$) and Games-Howell post-hoc tests indicated a significant difference in choice availability scores for people with severe ID compared to individuals with mild ($p = 0.003$) and moderate impairment ($p = 0.005$), with less choice for those with severe ID. Scores for people with mild and moderate ID were comparable.

For Factor 2 Levene's test was not significant, indicating equal variances between groups. Since however the assumption of normality was violated, for consistency with previous analyses the non-parametric Kruskal-Wallis H test was adopted to compare differences between different levels of ID. The test was significant ($H(2)=10.07, p=0.006$) and pairwise comparisons indicated that there were significant differences in scores between those with severe intellectual impairment compared to those with moderate ($U = 781.00, p = 0.007$) and mild impairment ($U = 164.50, p = 0.016$). The mean scores per level of intellectual impairment for both factors are presented in table 4.

Internal Consistency

Cronbach's alpha for Factor 1 'Everyday Choices' and Factor 2 'Participation in household activities' were 0.933 and 0.774 respectively.

Discussion

The present study explored the factor structure of a measure of choice availability (RCAS) for adults with ID and challenging behaviour supported by paid-carers in community settings. The study provided a solution for the scale which may be more suitable in the current context of care provision than the original scale which was developed at a time when the process of deinstitutionalisation had begun to accelerate but nonetheless saw a different landscape in the provision of care for people with ID than what we have today.

Results from the EFA were suggestive of a two-factor structure. The factors were named *Everyday choices* and *Participation in household activities*. The former included items related to the opportunity for the individual to make choices in his/her daily routine such as what to eat and what to do and the latter included items relative to the individual's participation in domestic activities such as preparing meals. Although the PAF demonstrated good factorial validity, the confidence intervals for the factor loadings were fairly large, indicating that the results must be interpreted with caution. Furthermore the factorial

structure in the present sample did not reflect the structure found by Kearney et al. (2006) which was represented by one short factor. The extraction methods in the two studies were however different. The authors of the original study reported conducting 'principal components factor analysis' which was guided by factor retention analysis using minimum average partial and parallel analysis. The choice to use EFA as opposed to PCA in the present study was determined by the general agreement among researcher that it is a stronger form of analysis and that PCA is not generally considered a factor analytic technique (Brown, 2009; Osborne, 2014). The fact that the analyses resulted in different solutions is not surprising as the settings in the two studies differed significantly. Whereas in the present study participants were recruited from community settings including individual supported living, in the previous study none of the participants were recruited from supported living accommodation types but they were all recruited from developmental centres and nursing homes with a high number of beds or smaller intermediate care facilities providing medically related services. Furthermore the original study includes a sample from a previous study published in 1998 (Kearney et al., 1998) which not only took place in different care settings (congregate) but it was also conducted nearly two decades ago. During this time much has changed in terms of ideology and practices in the provision of care for people with ID and these points are what constituted the rationale for a new EFA. The factors which emerged in the present study demonstrated good construct validity and internal consistency.

Five items did not load onto any factor. Some of these items which referred to service users '*being allowed*' to move around the home/building or be alone in their room may not be relevant in community settings where the great majority of individuals live in environments where the restrictive practices associated with congregate settings are no longer applied; similarly the item 'is the client's bedroom door locked at night' implies restriction and control from staff and may not be appropriate for use in the present day. Kearney et al. (2006) suggested that in future studies the item could be rephrased as "Does the client have a choice as to whether his/her bedroom is locked during the day/night?". The other non-

loading items represented choices which may not be applicable to some service users (e.g. 'Does the client choose whether he/she receives therapy sessions?') and future administrations of the scale could consider providing an N/A option for the respondent. The results of the EFA suggest that the scale could be reduced to 18 items (RCAS-18) when delivered in community settings and future investigators may consider omitting those items.

The item "Does the client choose his roommate?" had been left blank by the great majority of the respondent and was thus deleted from the scale. Nowadays it is typical for people with ID who live in the community to have their own room and therefore the question may be redundant. One however may wish to re-word the question and ask whether the participant decides who to live with although nevertheless this question may not be appropriate for the current questionnaires which addressed *everyday choices* rather than choices about major life events which have more permanent consequences.

Notably one of the items on the *participation in household activities* factor (Does the client choose which type of style or prosthetic device he/she utilises (e.g. wheelchair, braces?)) is actually related to choice and it is somewhat surprising that it did not load onto that factor. Nevertheless it has to be noted that this item prior to imputation had been left blank by 37% of respondents and perhaps its loading onto factor 2 as opposed to the everyday choices factor may be a result of imputation of a relatively large portion of missing data. The large proportion of missing data for this item may have been due to the fact that the item may not be applicable to a great number of individuals who may not require additional health aids. Providing an N/A option in future studies may reduce the amount of missing data and thus provided cleaner datasets.

Construct validity

In line with the original scale (and previous research such as Wehmeyer & Bolding, 1999) both factors of the scale were able to discriminate between different accommodation types,

and specifically they were able to differentiate between residential care homes and group supported living. Interestingly however there was no significant difference between everyday choices and participation in household activities in residential care homes and individual supported living or between group supported living and individual supported living. This is somewhat unexpected as previous research has shown that choice availability may be higher in smaller more individualised settings (Robertson et al., 2001; Stancliffe, 2001). However in England the principles of 'choice' and 'inclusion' for people with ID have been widely promoted by the White Paper 'Valuing People' (DOH, 2001) and its successor 'Valuing People Now' (DOH, 2009) and it is therefore possible that the differences in 'choice availability' and 'participation' in different settings in the community will not be as substantial as one may expect to observe between community living environments and the more restrictive institutions. A recent report from the the Centre for Social Justice (2016) emphasised that although supported living services are generally believed to provide a greater degree of autonomy and independence, residential care homes can be just as flexible and achieve high levels of personalisation. The significant difference in the present study found between choice availability in residential care homes and group supported living may be an artefact of the different compositions between the groups residing in those types of accommodation. In the present sample residential care homes were more likely to accommodate people with more severe needs which made up 57.14% of the people residing in such facilities; on the other hand supported living arrangements were more likely to accommodate individuals with lower support needs and less severe intellectual impairments with only 30% of people in group supported living being classified as having a severe ID. The difference in choice availability and participation in activities observed in those accommodation types might instead be reflective of a difference between people with different levels of impairment.

The scores for both *everyday choices* and *participation in household activities* were indeed significantly different for people with different levels of ID. Carers supporting people with

more severe learning disabilities provided significantly lower scores than those supporting individuals with moderate and mild ID. This finding is consistent with previous research which has consistently shown that individuals with more severe ID are provided with fewer opportunities to make choices in their everyday life compared to their counterparts with mild and moderate ID (Lakin et al., 2008; Ticha et al., 2012). If the difference observed between residential care homes and group supported living is indeed only an artefact of their different compositions then this would imply that choice availability and participation in activities is comparable across different accommodation types. This is in contrast with previous literature which found that choice is enabled differently in different types of accommodation (Vandergriff & Chubon, 1994; Wehmeyer & Bolding, 1999). Nevertheless it provides some optimism for the delivery of care for people with ID as it could provide an indication that care providers across different settings are embracing the principles of choice and engagement in a similar fashion, despite the recent emphasis on supported living arrangements.

Limitations

There are a number of limitations in the study. The sample size in the present study was relatively small as it has been suggested that a ratio of 10 respondents per variable should be used when conducting factor analyses (Field, 2005). Others have argued that a subjects-to-variables ratio larger than 5 is sufficient (Beavers et al., 2013) however Osborne (2014) has reported high numbers of published studies with subjects-to-variables ratios smaller than 5:1. Although the sample size could have indubitably benefited from being larger, it did have strengths as it was diverse and it included paid carers with varying years of experience working with the population group, different educational backgrounds working in various accommodation types in different parts of England including urban, rural and semi-rural areas. As recommended by Kearney et al. (2006) the service users constituted a diverse sample with different levels of intellectual impairment. Whereas the study by Kearney et al. (2006) only included individuals with severe/profound intellectual impairment, the present study also included individuals with moderate and mild impairment. Future research will

need to evaluate the adapted measure in a larger sample and over time to further investigate its psychometric properties. Confirmatory factor analyses in different and bigger samples should also be conducted.

Another important factor that should be considered is that although the instrument was originally developed to measure choice availability in an individual's residential environment, some of the items in the scale such as "does the client choose what tv programme he/she would like to watch?" may be interpreted as reflecting actual choice making rather than available choice; actual choice making however is likely to be influenced by the person's level of competence, so even though the carers were instructed to base their scores of choice availability for the individual, the wording of the questions may have been misleading. In future administrations of the scale it is advisable to rephrase such items as "does the client have a choice..." or "is the client supported to choose...".

Another important limitation is given from the fact that responses of choice availability were provided by paid carers who had been recruited for their participation on another study investigating challenging behaviour in people with ID. All the carers in the present sample were asked to base their responses of choice availability making references to the service-user who had taken part in the larger trial, all of which had challenging behaviour. The results of this study on choice availability therefore may not be generalisable, as paid carers who support individuals with ID without the presence of challenging behaviour may provide choice in a different manner. Previous research is unclear as to whether choice availability differs significantly between people with and without challenging behaviour (Lakin et al., 2008; Ticha et al., 2012). Although some studies have found more choice to be associated with lower levels of challenging behaviour (Hatton et al., 2004; Stancliffe, 2001), intellectual functioning, which has been shown to be a significant predictor of challenging behaviour, has often not been controlled for, and therefore the observed relationship between choice and challenging behaviour may be the result of an artefact of its relationship with intellectual

functioning. The adapted scale should therefore be administered to different samples, including carers supporting people without clinically significant or no challenging behaviour. One of the limitations of self-completed questionnaires is that they may provide biased responses. Answers given by carers may be subject to desirability bias and may not reflect reality. An obvious alternative to reduce bias is to ask people with ID directly about their experiences of choice-making. This method however has its own limitations as only those with mild/moderate impairment may be able to answer consistently and those with more severe impairment may not be able to respond thus leading to the exclusion of a significant portion of the sample. If proxy respondents are used only for individuals with more severe impairment, it has to be taken into account that the accuracy of the responses may differ across the sample. In response to this issue Hatton et al. (2004) developed a choice measure which, where service-users cannot respond directly for themselves, caregivers are asked to provide concrete examples of how choice is made available and a rating is given by the researcher. This method may be helpful to reduce bias, however as the measure is administered by interview it may be time-consuming and not always practical to administer. A major strength of the RCAS is that it can be self-completed in short amounts of time.

In the present study it was not possible to assess the concurrent validity of the scale as no other measures of choice availability were administered; future studies should aim to test the measure's performance against other choice measures. Test re-test and inter-rater reliability should also be explored.

Conclusion

The study provided new information regarding the RCAS's factor structure in a different context and examined the construct validity and internal consistency of the emerging factors. The results of the analyses indicate that a scale with two factors may be reduced to a scale with 18 items (RCAS-18) with the potential to be used as an evaluative research tool to objectively assess everyday choice availability and participation in household activities for

people with ID living in settings within the community. The scale could also potentially be used as part of intervention approaches to improve and enhance service user quality of life. Confirmatory factor analyses in larger samples are however warranted.

Finally, it has to be taken into account that the possibilities to make choices are infinite and that, as with any other choice measure, this instrument cannot capture all the possible available choices. Although the instrument could be used as a starting point to assess the availability of choice for individuals in community settings and to identify areas where choice-making can be improved, it has to be considered that choices which may be of particular relevance to the individual may not be included. The measure is available from the authors.

References

- Aman, M. G., Singh, N. N., Stewart, A. W., & Field, C. J. (1985). The aberrant behavior checklist: a behavior rating scale for the assessment of treatment effects. *Am J Ment Defic, 89*, 485–491. JOUR.
- Beadle-Brown, J. (2006). Person-Centred Approaches and Quality of Life. *Tizard Learning Disability Review, 11*(3), 4–12.
- Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment, Research & Evaluation, 18*(6), 1–13.
- Brown, J. D. (2009). Principal components analysis and exploratory factor analysis – Definitions, differences and choices. *Shiken: JALT Testing & Evaluation SIG Newsletter, 13*(1), 26–30.
- COAG. (2011). 2010-2020 National Disability Strategy. Retrieved from www.coag.gov.au/sites/default/files/national_disability_strategy_2010-2020.pdf
- Department of Health. (2007). Services for People with Learning Disabilities and Challenging Behaviour or Mental Health Needs (Mansell report-revised edition 2007), 35. Retrieved from http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/dh_080129
- Department of Health. (2012). Transforming care: A national response to Winterbourne View Hospital, 62. [http://doi.org/Gateway reference 18348](http://doi.org/Gateway%20reference%2018348)
- DOH. (2001). Valuing People. A New Strategy for Learning Disability for the 21st Century. (D. of Health, Ed.). GOVDOC. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/250877/5086.pdf
- DOH. (2009). Valuing People Now: a new three-year strategy for learning disabilities . (D. of Health, Ed.). GOVDOC. Retrieved from http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_093375.pdf
- Emerson, E., Robertson, J., Gregory, N., Hatton, C., Kessissoglou, S., Hallam, A., ... Walsh, P. N. (2001). Quality and costs of supported living residences and group homes in the United Kingdom. *American Journal on Mental Retardation, 106*(5), 401–415. Retrieved from

- http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=11531460
- Field, A. (2005). *Discovering Statistics Using SPSS. Ism Introducing Statistical Methods* (Vol. 2nd). <http://doi.org/10.1016/j.landurbplan.2008.06.008>
- Frost, J. (2014). Did Welch's ANOVA Make Fisher's Classic One-Way ANOVA Obsolete? Retrieved September 14, 2016, from <http://blog.minitab.com/blog/adventures-in-statistics/did-welchs-anova-make-fishers-classic-one-way-anova-obsolete>
- Gie Yong, A., & Pearce, S. (2013). A Beginner's Guide to Factor Analysis: Focusing on Exploratory Factor Analysis. *Tutorials in Quantitative Methods for Psychology*, 9(2), 79–94.
- Hassiotis, A., Strydom, A., Crawford, M., Hall, I., Omar, R., Vickerstaff, V., ... King, M. (2014). Clinical and cost effectiveness of staff training in Positive Behaviour Support (PBS) for treating challenging behaviour in adults with intellectual disability: A cluster randomised controlled trial. *BMC Psychiatry*, 14(219), 1–10. <http://doi.org/10.1186/s12888-014-0219-6>
- Hatton, C., Emerson, E., Robertson, J., Gregory, N., Kessissoglou, S., Perry, J., ... Hillery, J. (2001). The adaptive behavior scale-residential and community (part I): towards the development of a short form. *Research in Developmental Disabilities*, 22(4), 273–288.
- Hatton, C., Emerson, E., Robertson, J., Gregory, N., Kessissoglou, S., & Walsh, P. N. (2004). The Resident Choice Scale: A measure to assess opportunities for self-determination in residential settings. *Journal of Intellectual Disability Research*, 48(2), 103–113. <http://doi.org/10.1111/j.1365-2788.2004.00499.x>
- Kearney, C. A., Bergan, K. P., & McKnight, T. J. (1998). Choice availability and persons with mental retardation: A longitudinal and regression analysis. *Journal of Developmental & Physical Disabilities*, 10(3) Sep(3), US, <http://www.> <http://doi.org/10.1023/a:1022872108663>
- Kearney, C. A., Cook, L. C., Chapman, G., & Bensaheb, A. (2006). Exploratory and confirmatory factor analyses of the motivation assessment scale and resident choice assessment scale. *Journal of Developmental and Physical Disabilities*, 18(1), 1–11. <http://doi.org/10.1007/s10882-006-9000-1>
- Kearney, C. A., Durand, V. M., & Mindell, J. A. (1995). Choice Assessment in Residential Settings. *Journal of Developmental and Physical Disabilities*, 7, 203–213. JOUR. <http://doi.org/Doi 10.1007/Bf02585425>
- Kern, L., Vorndran, C. M., Hilt, A., Ringdahl, J. E., Adelman, B. E., & Dunlap, G. (1998). Choice as an intervention to improve behavior: A review of the literature. *Journal of Behavioral Education*, 8(2), 151–169. <http://doi.org/10.1023/a:1022831507077>
- Kishi, G., Teelucksingh, B., Zollers, N., Park-Lee, S., & Meyer, L. (1988). Daily decision-making in community residences: a social comparison of adults with and without mental retardation. *American Journal of Mental Retardation : AJMR*, 92(5), 430. Retrieved from Available from American Journal on Mental Retardation in <http://link.worldcat.org/?jHome=http://www.hlisd.org/AtoZBrowse.aspx?browsetype=library&linktype=best>
- Lakin, K. C., Doljanac, R., Byun, S. Y., Stancliffe, R., Taub, S., & Chiri, G. (2008). Choice-making among Medicaid HCBS and ICF/MR recipients in six states. *American Journal on Mental Retardation*, 113, 325–342. JOUR. <http://doi.org/Doi 10.1352/2008.113:325-342>
- Osborne, J. W. (2014). *Best Practices in Exploratory Factor Analysis*. Louiseville, NY: CreateSpace Independent Publishing Platform.
- Prosser, H., Moss, S., Costello, H., Simpson, N., Patel, P., & Rowe, S. (1998). Reliability and validity of the Mini PAS-ADD for assessing psychiatric disorders in adults with intellectual disability. *Journal of Intellectual Disability Research : JIDR*, 42 (Pt 4)(August), 264–272.
- Reid, D. H., Everson, J. M., & Green, C. W. (1999). A systematic evaluation of preferences identified through person-centered planning for people with profound multiple disabilities. *Journal of Applied Behavior Analysis*, 32(4), 467–77.

- <http://doi.org/10.1901/jaba.1999.32-467>
- Robertson, J., Emerson, E., Hatton, C., Gregory, N., Kessissoglou, S., Hallam, A., & Noonan Walsh, P. (2001). Environmental opportunities and supports for exercising self-determination in community-based residential settings. *Research in Developmental Disabilities, 22*(6), 487–502. [http://doi.org/10.1016/S0891-4222\(01\)00085-3](http://doi.org/10.1016/S0891-4222(01)00085-3)
- Shalock, R. L., & Keith, K. D. (1993). *Quality of Life Questionnaire Manual*. Worthington, OH: IDS Publishing Corporation.
- Stancliffe, R. J. (2001). Living with support in the community: Predictors of choice and self-determination. *Mental Retardation and Developmental Disabilities Research Reviews, 7*, 91–98. JOUR. <http://doi.org/Doi 10.1002/Mrdd.1013>
- Stancliffe, R. J., & Parmenter, T. R. (1999). The Choice Questionnaire : A scale to assess choices exercised by adults with intellectual disability, *24*(2), 107–132.
- The Centre for Social Justice. (2016). *The Need for Community: A study of housing for adults with learning disabilities*.
- Ticha, R., Lakin, K. C., Larson, S. A., Stancliffe, R. J., Taub, S., Engler, J., ... Moseley, C. (2012). Correlates of Everyday Choice and Support-Related Choice for 8,892 Randomly Sampled Adults with Intellectual and Developmental Disabilities in 19 States. *Intellectual and Developmental Disabilities, 50*, 486–504. JOUR. <http://doi.org/Doi 10.1352/1934-9556-50.06.486>
- Vandergriff, D. V., & Chubon, R. A. (1994). Quality of Life Experienced by Persons with Mental Retardation in Various Residential Settings. *Journal of Rehabilitation, 60*(4).
- Wechsler, D. (1999). Wechsler Abbreviated Scale of Intelligence (WASI). Retrieved from <http://www.pearsonclinical.com/education/products/100000593/wechsler-abbreviated-scale-of-intelligence-wasi.html>
- Wehmeyer, M. L., & Bolding, N. (1999). Self-determination across living and working environments: A matched-samples study of adults with mental retardation. *Mental Retardation, 37*(5), 353–363. [http://doi.org/10.1352/0047-6765\(1999\)037<0353:SALAWE>2.0.CO;2](http://doi.org/10.1352/0047-6765(1999)037<0353:SALAWE>2.0.CO;2)

Appendices

Appendix A

Factor loadings pattern matrix of EFA with non-loading items omitted

Item	Factor		Communality
	1	2	
Does the client choose the time he/she brushes his/her teeth?	0.95	-0.16	0.82
Does the client choose the time he/she takes a bath/shower?	0.89	-0.14	0.77
Does the client choose the time he/she wakes up in the morning?	0.72	-0.21	0.57
Does the client choose his/her own activities during the day?	0.69	-0.01	0.75
Does the client choose his/her bedtime?	0.69	-0.01	0.61
Does the client choose his/her own clothes in the morning?	0.67	0.18	0.70
Does the client choose which activities he/she will participate in during the weekend?	0.64	0.28	0.70
For group activities, does the client choose whether or not he/she participates?	0.63	0.04	0.56
Does the client have a choice as to whether h/she has visitors?	0.61	0.01	0.52
Does the client choose which tv program he/she would like to watch?	0.61	0.24	0.81
Does the client have a choice as to when he/she eats?	0.60	0.11	0.56
Does the client have a choice at mealtimes?	0.59	0.23	0.56
Does the client choose which radio program he/she would like to listen to?	0.58	0.32	0.83
Does the client participate in doing his/her laundry?	-0.02	0.77	0.67
Does the client participate in the clean up after meals?	-0.02	0.76	0.57
Is the client responsible for the clean-up of his/her bedroom?	0.08	0.68	0.59
Does the client participate in the preparation of meals?	0.07	0.45	0.25
Does the client choose which type of adaptive equipment or prosthetic device to utilise?	0.36	0.42	0.69

Appendix B

Shapiro Wilk test of normality

Factor 1. (S-W=0.794, $df=108$, $p<.001$)

Factor 2. (S-W=0.965, $df= 08$, $p=0.007$)

Levene's test of homogeneity of variance

Residential settings

Factor 1. ($F(2,105)=3.403$, $p=0.06$)

Factor 2. ($F(2,105)=0.477, p=0.622$)

Level of ID

Factor 1. ($F(2,105)=9.15, p<0.001$)

Factor 2. ($F(2,105)=0.306, p=0.737$)