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Different Factors Influence Self-Reports and Third-Party Reports of Anger by Adults with Intellectual Disabilities

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Background Many people with intellectual disabilities display high levels of anger, and cognitive-behavioural anger management interventions are used routinely. However, for these methods to be used optimally, a better understanding is needed of different forms of anger assessment. The aim of this study was to investigate the relationship of a range of measures to self- and carer reports of anger expression, including instruments used to assess mental health and challenging behaviour.

Method Adults with intellectual disabilities, who had been identified as having problems with anger control, their key-workers and home carers all rated the service users’ trait anger, using parallel versions of the same instrument (the Provocation Inventory). In addition, service users completed a battery of mental health assessments (the Glasgow Depression Scale, Glasgow Anxiety Scale and Rosenberg Self-Esteem Scale), and both groups of carers completed a battery of challenging behaviour measures (the Hyperactivity and Irritability domains of the Aberrant Behavior Checklist and the Modified Overt Anger Scale).

Results Participants had high levels of mental health problems (depression: 34%; anxiety: 73%) and severe challenging behaviour (26%). Hierarchical linear regression analysis was used to explore the extent to which anger ratings by the three groups of respondents were predicted by demographic factors, mental health measures and challenging behaviour measures. Older service users rated themselves as less angry and were also rated as less angry by home carers, but not by key-workers. More intellectually able service users were rated as more angry by both sets of carers, but not by the service users themselves. Significantly, mental health status (but not challenging behaviour) predicted service users’ self-ratings of anger, whereas challenging behaviour (but not mental health status) predicted carers’ ratings of service users’ anger.

Conclusions Service users and their carers appear to use different information when rating the service users’ anger. Service users’ self-ratings reflect their internal emotional state and mental health, as reflected by their ratings of anxiety and depression, whereas staff rate service users’ anger on the basis of overt behaviours, as measured by challenging behaviour scales.

Keywords: anger, challenging behaviour, intellectual disability, mental health

Introduction

Anger is a frequent problem for many people with intellectual disabilities, and while many individuals are able to manage anger appropriately, it is often expressed as verbal and/or physical aggression (Taylor et al. 2005; Benson & Brooks 2008). Prevalence estimates for problem anger among people with intellectual disabilities vary between 11 and 27% (Rose et al. 2008). A recent review of studies of aggressive challenging behaviour reported that...
over 50% of people with intellectual disabilities display some form of aggression (Benson & Brooks 2008). Aggression resulting from uncontrolled anger can lead to serious consequences, which include exclusion from services, breakdown of residential placements and involvement with the criminal justice system (Allen et al. 2007; Emerson et al. 2008; Mental Health Foundation 2008). Aggressive behaviour can also have an impact on the psychological well-being of care staff (Jenkins et al. 1999) and the quality of care they provide (Rose et al. 1997).

Anger is an active area of therapeutic research. A number of small trials have shown beneficial outcomes of cognitive-behavioural interventions for people with intellectual disabilities (Taylor et al. 2008; Willner 2007). The evaluation of anger is usually by service users’ self-reports (e.g. Taylor et al. 2002, 2004, 2005; Hagiliassis et al. 2005; Rose et al. 2005, 2008, 2009). However, some studies have used carer third-party reports instead of (e.g. King et al. 1999; Rose 2010), or in addition to, self-reports (e.g. Willner et al. 2002, 2005; Lindsay et al. 2004; Willner 2007). The extent to which self- and third-party reports of anger provide the same or different information is unknown. However, there is reason to suspect that they may, to some extent, reflect different constructs. For example, Rose & Gerson (2009) found no relationship between self- and staff-reported anger using parallel forms of an anger provocation inventory, prior to participating in an anger management programme. (However, these measures were significantly correlated afterwards if both the service users and their staff carers participated in the intervention.) Earlier studies also reported discrepancies relationship between self- and staff-reported ratings of anger (Bramston & Fogarty 2000; Benson & Ivins, 1992) and challenging behaviour (Voelker et al., 1990). Significant correlations have been reported between staff ratings on an Anger Inventory and a range of measures of challenging behaviour rated by the same staff (Rose & Gerson 2009). However, self-reports of anger on the same Anger Inventory have been found to be related to change in self-reported depression (Rose et al. 2000), suggesting an association between self-reported anger and the self-report of other psychological difficulties. Anger is closely related to depression and other mental health problems both in the general population (Painuly et al. 2005; Balsamo 2010; Mahon et al. 2010) and in people with intellectual disabilities (Davis et al. 1997; Hurley 2008).

While there is certainly some relationship between service users’ mental health problems and their challenging behaviour (Meins 1995; Moss et al. 2000), these findings point to the possibility that the information used by carers when making third-party ratings of service users’ anger may differ from that informing service users’ own self-ratings. On the basis of these earlier studies, we predicted that service users’ own anger ratings would be related to other self-reports of mental health status, but that carers’ anger ratings would be related more strongly to the service users’ observable challenging behaviour. Factors predictive of anger ratings by service users and two groups of carers were identified using hierarchical regression analyses. This method was preferred to the simple linear regression analysis used in earlier studies (Rose et al. 2005; Rose 2010) because the study included several measures of both mental health and challenging behaviour.

**Methods**

Multicentre ethical approval for the study was granted by South East Wales Research Ethics Committee. R&D approval was granted in all regions, with additional participation identification centre approval where required.

**Participants**

The participants in this study were recruited to a cluster-randomized trial of anger management, the outcomes of which will be reported separately (Willner et al. 2011). They were 181 service users (128 men and 53 women) who attended one of 30 services providing day activities for people with intellectual disabilities, located in the English midlands, south Wales and central Scotland, along with their key-workers (n = 124: 48 men and 76 women) and, where possible, a home carer (n = 127: men 45 and women 82). The number of key-workers is smaller than the number of service users because some key-workers acted for more than one service user. The median (IQR) age (years) of each group was as follows: service users, 38 (28–47); key-workers 46 (40–52); home carers 50 (34–58). The participating services included 17 traditional local authority day services, 5 independent-sector day services and 8 residential services that also provided day activities for their residents. Most of the service users lived in the family home (41%) or in staffed/supported living arrangements (38%).

The inclusion criteria for the trial were that service users were considered by their service to display problem levels of anger and wished to learn to improve their anger management, were able to provide consent to participate in the trial and were assessed as able to...
complete Likert-type scales. Potential participants were excluded if they were attending the service for a reason other than a diagnosed intellectual disability or were currently receiving or urgently requiring psychological treatment for anger or aggression. Service users had a median (IQR) Full Scale IQ of 57 (53–62), as assessed by the Wechsler Abbreviated Scale of Intelligence (WASI), and a mean (SD) score of 85 (16) on the short version of the Adaptive Behavior Scale, which converts to a full-ABS score of 223, equivalent to the 75th percentile of people with intellectual disabilities living in residential or community care (Hatton et al. 2001).

Procedure
Assessments were conducted face-to-face by research assistants who had no other contact with the respondent’s service. All three groups of respondents completed the Provocation Index (PI), a direct measure of felt response to defined situations that might provoke anger that has frequently been used with this service-user group (Novaco 1994; Taylor et al. 2005). It consists of a list of 25 different situations that can evoke anger, each of which is rated on a four-point scale (0–3) for the amount of anger evoked. Scores on this measure have been shown to correlate with staff-reported levels of aggression (Taylor et al. 2005).

Service users completed the following mental health assessments: the Glasgow Depression and Anxiety Scales, which are established measures of depression and anxiety among people with an intellectual disability (Cuthill et al. 2003; Mindham & Espie 2003), and an adaptation of the Rosenberg Self-Esteem Scale for people with an intellectual disability (Dagnan & Sandhu 1999).

Challenging behaviour was assessed by key-worker and home-carer report using the Hyperactivity and Irritability domain items of the Aberrant Behavior Checklist (ABC) (Aman et al. 1985) and the Modified Overt Aggression Scale (MOAS) (Oliver et al. 2007). Key-workers also completed the Controllability Beliefs Scale (CBS) (Dagnan et al. 2004), which measures their attributions in respect of challenging behaviour.

Statistical analysis
The data reported are for participants for whom complete data were available for all of the variables included in the analyses (service users, \(n = 163\); key-workers, \(n = 113\), reporting on 162 service users; home carers, \(n = 114\)). Where a key-worker acted for more than one service user, the data were treated as though they were independent. Standard model diagnostics were carried out for all reported analyses.

The analysis was in two stages. First, bivariate product–moment correlations (Pearson or Spearman, depending on the distribution of the data) were computed for all variables. Then, three hierarchical linear regression analyses were conducted to predict service-user, key-worker and home-carer PI scores. Variables were entered in three blocks: demographic variables, mental health measures and challenging behaviour measures. For service users, the first block included age, gender and IQ; for key-workers and home carers, the respondent’s age was also included. The second block included the service users’ ratings on the three mental health measures: GDS, GAS and RSES. The third block included the three challenging behaviour measures: ABC-H, ABC-I and MOAS; key-worker ratings were used for the service user and key-worker analyses, and home-carer ratings were used for the home-carer analysis. On a visual inspection of the residuals and the residuals plotted against the predicted values, there appeared to be no obvious outliers in the service-user and key-worker data sets. There appeared to be one outlier in the home-carer data set, but excluding this value did not change the conclusions of the analysis. Multicollinearity checks, using the variance inflation factor, did not identify collinearity issues in any of the models tested.

Results
PI scores were similar to those observed in earlier studies on a comparable population (Willner et al. 2005; Willner 2007), with service users rating themselves somewhat higher than they were rated by their key-workers or home carers [mean (SD) PI scores: 44 (17), 33 (13), 30 (13), respectively; \(F_{(2,487)} = 38.05, P < 0.001\)].

A relatively high proportion of service users displayed significant levels of depression, with 34% of them scoring at or above the cut-off value for clinical depression of 13 on the Glasgow Depression Scale (Cuthill et al. 2003). An even higher proportion of service users displayed significant anxiety symptoms, with 73% scoring at or above the cut-off value for clinical anxiety of 13 on the Glasgow Anxiety Scale (Mindham & Espie 2003).

In a previous work, severe challenging behaviour has been defined by a criterion of either a combined score of >30 on the ABC-H and ABC-I or >4 behaviours on these two scales rated as a severe problem (i.e. at level 3) (Robertson et al. 2004). 47 service users (26% of the sample) met this criterion.
Correlations between clinical variables

Service-user PI ratings were only marginally correlated with carer ratings (key-workers: \( r = 0.158, P = 0.044 \); home carers: \( r = 0.174, P = 0.062 \), but the correlation between the two carer ratings was much larger (\( r = 0.356, P < 0.001 \)), suggesting that key-workers and home carers see service-user anger similar to one another, but there is more divergence between carer ratings and service users’ self-perception.

Service-user ratings on the three mental health measures were significantly intercorrelated (all \( P < 0.001 \)). The highest correlation was between the depression and anxiety scores (GDS versus GAS: \( r = 0.697 \)). Correlations with self-esteem (RSES) were lower (\( r = -0.384, -0.302 \), respectively).

Similarly, both key-worker and home-carer ratings on the three challenging behaviour measures were strongly intercorrelated (all \( r > 0.445, P < 0.001 \)). The correlations between key-worker and home-carer ratings were highly significant for the MOAS (\( r = 0.486, P < 0.001 \)), less so for the ABC-I (\( r = 0.243, P < 0.01 \)) and just not significant for the ABC-H (\( r = 0.176, P = 0.059 \)).

All three key-worker ratings of challenging behaviour were significantly correlated with their ratings on the Controllability Beliefs Scale (ABC-H: \( r = 0.173, P < 0.02 \); ABC-I: \( r = 0.188, P < 0.02 \); MOAS: \( r = 0.148, P < 0.05 \)), indicating that service users who were seen as more able to control their challenging behaviour were rated as more challenging. Key-workers’ CBS ratings were not significantly related to age (\( r = 0.044 \)), IQ (\( r = 0.133 \)) or gender (\( t = 1.1 \)). Key-workers’ ratings of challenging behaviour were also unrelated to IQ (\( r = -0.04 \) on all three measures).

Regression analyses

The regression analyses for the three sets of PI ratings are summarized in Table 1, with the significant predictors that are discussed below highlighted. The upper part of the table shows the estimated effect size and \( P \)-value for each of the individual variables; the lower part of the table shows the goodness of fit for each overall model, the proportion of variance (raw and adjusted \( R^2 \)) accounted for by each block of data and the change in \( R^2 \) attributable to each block of data, with the associated \( P \)-value.

For service users, demographic variables were a marginally significant predictor of PI ratings (block 1: \( P = 0.047 \)), and the model improved very significantly when mental health variables were added (block 2: \( P < 0.001 \)); adding challenging behaviour variables (block 3) did not significantly improve the model. The significant predictors were age (older service users rated themselves as less angry) and anxiety. As anxiety was highly correlated with depression, the latter is interpreted as a proxy for poor mental health.

For both key-workers and home carers, IQ was a significant predictor of their PI ratings, with more able service users rated as more angry. For key-workers, the addition of mental health variables significantly improved the model (block 2: \( P = 0.012 \)), reflecting a significant effect of depression (\( P = 0.007 \)), which was also almost significant in the home-carer model (\( P = 0.053 \)). However, for both sets of carers, the effect of depression disappeared when challenging behaviour was added to the model (block 3: \( P < 0.001 \), with significant prediction of PI by ABC-I scores (key-workers) and MOAS scores (home carers). Again, given the high intercorrelations between challenging behaviour measures, these results are interpreted to mean that challenging behaviour was a more important predictor of PI ratings for both sets of carers than their perceptions of the service users’ mental health. The significant effect of GDS score in block 2 but not in block 3 of the key-worker model probably reflects the fact that these ratings were significantly correlated with key-worker ABC-I scores (\( r = 0.348, P < 0.001 \)).

A further predictor in the home-carer model was age, which was significant in all three stages of the analysis: older service users were rated as less angry, consistent with service users’ self-ratings. However, there was no hint of this relationship in key-worker ratings, where the first-order correlation between age and PI was close to zero (\( r = 0.01 \)).

The outcomes of these analyses are summarized in Figure 1. Older service users were rated as less angry by service users and home carers but not by key-workers; more intellectually able service users were rated as more angry by both sets of carers but not by the service users themselves; and, as predicted, mental health status (but not challenging behaviour) predicted service users’ self-ratings of anger, whereas challenging behaviour (but not mental health) predicted carers’ ratings of service users’ anger.

Discussion

The participants in this study were not a random sample of people with intellectual disabilities. They were recruited to a controlled trial of anger management on the basis that they were considered by
Table 1 Predictors of provocation index (PI) score at baseline

<table>
<thead>
<tr>
<th>Block</th>
<th>Variable</th>
<th>Service-user model (n = 163)</th>
<th>Key-worker model (n = 162)</th>
<th>Home-carer model (n = 114)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beta</td>
<td>P-value</td>
<td>Beta</td>
</tr>
<tr>
<td>1: Demographics</td>
<td>Age of SU</td>
<td>-0.17</td>
<td>0.029</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Age of KW</td>
<td>-0.08</td>
<td>0.309</td>
<td>-0.21</td>
</tr>
<tr>
<td></td>
<td>Age of HC</td>
<td>0.11</td>
<td>0.169</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Gender of SU</td>
<td>0.11</td>
<td>0.169</td>
<td>-0.06</td>
</tr>
<tr>
<td></td>
<td>Gender of KW</td>
<td>0.07</td>
<td>0.343</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Gender of HC</td>
<td>0.07</td>
<td>0.343</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Full Scale IQ</td>
<td>0.07</td>
<td>0.343</td>
<td>0.21</td>
</tr>
<tr>
<td>2: Demographics and mental health scores</td>
<td>Age of SU</td>
<td>-0.16</td>
<td>0.033</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Age of KW</td>
<td>-0.09</td>
<td>0.233</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Age of HC</td>
<td>0.15</td>
<td>0.052</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Gender of SU</td>
<td>0.15</td>
<td>0.052</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Gender of KW</td>
<td>0.05</td>
<td>0.494</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>Gender of HC</td>
<td>0.05</td>
<td>0.494</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>Full Scale IQ</td>
<td>0.05</td>
<td>0.494</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>GDS</td>
<td>0.12</td>
<td>0.257</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>GAS</td>
<td>0.24</td>
<td>0.020</td>
<td>-0.08</td>
</tr>
<tr>
<td></td>
<td>GDS</td>
<td>0.12</td>
<td>0.257</td>
<td>0.30</td>
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<tr>
<td></td>
<td>GAS</td>
<td>0.24</td>
<td>0.020</td>
<td>-0.08</td>
</tr>
<tr>
<td></td>
<td>Full Scale IQ</td>
<td>0.05</td>
<td>0.494</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>GDS</td>
<td>0.12</td>
<td>0.257</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>GAS</td>
<td>0.24</td>
<td>0.020</td>
<td>-0.08</td>
</tr>
<tr>
<td>3: Demographics, mental health</td>
<td>Age of SU</td>
<td>-0.18</td>
<td>0.027</td>
<td>-0.05</td>
</tr>
<tr>
<td></td>
<td>and challenging</td>
<td>Age of KW</td>
<td>-0.01</td>
<td>0.911</td>
</tr>
<tr>
<td></td>
<td>behaviour scores</td>
<td>Age of HC</td>
<td>0.16</td>
<td>0.052</td>
</tr>
<tr>
<td></td>
<td>Age of HC</td>
<td>0.16</td>
<td>0.052</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Gender of SU</td>
<td>0.16</td>
<td>0.052</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Gender of KW</td>
<td>0.05</td>
<td>0.506</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Gender of HC</td>
<td>0.05</td>
<td>0.506</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Full Scale IQ</td>
<td>0.05</td>
<td>0.506</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>GDS</td>
<td>0.11</td>
<td>0.318</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>GAS</td>
<td>0.25</td>
<td>0.019</td>
<td>-0.07</td>
</tr>
<tr>
<td></td>
<td>RSES</td>
<td>0.01</td>
<td>0.913</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>ABC-H (KW)</td>
<td>0.01</td>
<td>0.913</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>ABC-H (HC)</td>
<td>-0.09</td>
<td>0.401</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>ABC-I (KW)</td>
<td>-0.09</td>
<td>0.401</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>ABC-I (HC)</td>
<td>0.04</td>
<td>0.759</td>
<td>0.26</td>
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<tr>
<td></td>
<td>MOAS (KW)</td>
<td>0.03</td>
<td>0.761</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>MOAS (HC)</td>
<td>0.03</td>
<td>0.761</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Summary of PI models: goodness of fit measures

<table>
<thead>
<tr>
<th>Model</th>
<th>F</th>
<th>df</th>
<th>P (model)</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>R² Change</th>
<th>P (change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1 (SU)</td>
<td>2.71</td>
<td>3,162</td>
<td>0.047</td>
<td>0.049</td>
<td>0.031</td>
<td>0.049</td>
<td>0.047</td>
</tr>
<tr>
<td>Block 2 (SU)</td>
<td>5.03</td>
<td>6,162</td>
<td>&lt;0.001</td>
<td>0.162</td>
<td>0.130</td>
<td>0.113</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Block 3 (SU)</td>
<td>3.39</td>
<td>9,162</td>
<td>&lt;0.001</td>
<td>0.166</td>
<td>0.117</td>
<td>0.004</td>
<td>0.851</td>
</tr>
<tr>
<td>Block 1 (KW)</td>
<td>1.98</td>
<td>5,161</td>
<td>0.084</td>
<td>0.060</td>
<td>0.030</td>
<td>0.060</td>
<td>0.084</td>
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<tr>
<td>Block 2 (KW)</td>
<td>2.72</td>
<td>8,161</td>
<td>0.008</td>
<td>0.125</td>
<td>0.079</td>
<td>0.065</td>
<td>0.012</td>
</tr>
<tr>
<td>Block 3 (KW)</td>
<td>3.74</td>
<td>11,161</td>
<td>&lt;0.001</td>
<td>0.215</td>
<td>0.158</td>
<td>0.091</td>
<td>0.001</td>
</tr>
<tr>
<td>Block 1 (HC)</td>
<td>4.52</td>
<td>5,113</td>
<td>0.001</td>
<td>0.173</td>
<td>0.135</td>
<td>0.173</td>
<td>0.001</td>
</tr>
<tr>
<td>Block 2 (HC)</td>
<td>3.85</td>
<td>8,113</td>
<td>0.001</td>
<td>0.227</td>
<td>0.168</td>
<td>0.054</td>
<td>0.069</td>
</tr>
<tr>
<td>Block 3 (HC)</td>
<td>5.61</td>
<td>11,113</td>
<td>&lt;0.001</td>
<td>0.377</td>
<td>0.310</td>
<td>0.150</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Significant beta and P-values (<0.05) are bold-faced.
their service to display problem levels of anger. Not surprisingly, given the well-described relationship between anger and challenging behaviour among people with intellectual disabilities (Taylor et al. 2005; Benson & Brooks 2008; Rose et al. 2008), high levels of challenging behaviour were also reported for some participants. There is a limit to the extent of challenging behaviour that could in principle be observed in this study because most of the services from which participants were recruited would often exclude individuals who are overtly challenging. Nevertheless, 26% of participants met the criterion for severe challenging behaviour. While this is not a high proportion of the sample, the proportion among the general population supported by the participating services would be lower. Mean ABC scores were about 30% higher than those reported in an unselected sample of individuals attending comparable services (Rose & Gerson 2009). Using the same criterion, rates of severe challenging behaviour have been reported to be 15% in the general population of people with intellectual disabilities (Felce et al. 2009) and 22% in residential services (Felce et al. 2011). These figures include individuals with severe and profound disabilities and people who challenge at a level that cannot be managed within many services providing day activities. Neither of these groups would have been eligible for the present study. Because this was a relatively challenging sample, who had been identified as having problems with anger control, it is uncertain whether the present results would generalize to service users with fewer anger issues.

In addition to challenging behaviour, the participants also reported very high levels of psychopathology. Population estimates of the prevalence of depression and anxiety among people with intellectual disabilities are, respectively, <4 and 5–10% (Eaton & Menolascino 1982; Borthwick-Duffy 1994a; Deb et al. 2001). However, among the present participants, 34 and 73% met the Glasgow Scale criteria for diagnoses of depression and anxiety, respectively. The association between problem anger and high levels of psychopathology is consistent with previous reports in people with intellectual disabilities (e.g. Moss et al. 2000) and in the general population (e.g. Hull et al. 2003; Novaco 2003; Ghazinour & Richter 2009).

For all three sets of respondents, significant predictors of PI scores were identified, which included both demographic (age, IQ) and clinical variables. The regression models account for a relatively small proportion of the overall variance (12–31%), but this is not surprising, considering that the models did not

Figure 1 Predictors of PI scores. Within the circles are shown the intercorrelations between measures of mental health (MH: above) and challenging behaviour (CB: below). The arrows to the right of the circles show the individual measures (above the arrow) and blocks of data (below the arrow) that significantly predict PI scores. Other significant predictors (age and IQ) are shown to the right.
include any variables directly related to the service users’ personal history or environment.

To the best of our knowledge, this is the first study to report age-related changes in anger in people with intellectual disabilities. However, the decline in anger with age is consistent with the literature on challenging behaviour, which is known to increase during childhood, with a peak in young adulthood and a subsequent decline (Borthwick-Duffy 1994b; Holden & Gitlesen 2006). There are several reports in the general population that adults experience anger less frequently and intensely with increasing age (Gross et al. 1997; McConatha et al. 1997; Phillips et al. 2006; Schieman 1999; Schieman 2010), express anger less destructively (Thomas 1995, 2002; Tangney et al. 1996) and are less prone to attribute anger to others (Riediger et al. 2011). The decrease in anger with age reported by service users and their home carers is consistent with these studies and extends the observation of decreasing anger with age to people with intellectual disabilities. However, while the age-related decline in anger was reported by the service users themselves and their home carers, it was not reported by their key-workers. We have no explanation for this difference.

Both sets of carers rated more able participants as more angry. We are not aware of any previous studies of the prevalence of anger in relation to IQ. There have been a number of studies of aggressive challenging behaviour in relation to IQ, but these are inconsistent: they include reports of an increase (Borthwick-Duffy 1994b; Holden & Gitlesen 2006); Tyrer et al. 2006); no change (McCintock et al. 2003; Howe et al. 2007; Felce & Kerr 2012) or a decrease (Holden & Gitlesen 2006) in aggression as the degree of intellectual impairment increases. We did not observe any relationship between challenging behaviour and IQ, perhaps because the IQ range was narrower than in previous studies, which, unlike the present study, also included people with severe and profound disabilities.) One potential explanation of the positive relationship between anger and IQ is that staff may consider more able service users to have more effective control over their aggressive behaviour, which, for example, would enable more intellectually able service users to express their anger in more sophisticated ways, such as planned aggression or acts of revenge. A relationship between control and IQ is suggested by the finding of Tynan & Allen (2002) that staff judged individuals with ‘mild disabilities’ to be more in control of their physically aggressive behaviour than individuals with ‘severe disabilities’ who displayed similar behaviour. Indeed, we did find small correlations indicating that service users who were rated as more in control of their behaviour were also rated as somewhat more challenging. A similarly sized correlation (albeit non-significant because the sample was smaller) was reported by Mills & Rose (2011). However, while there was a small correlation between key-worker ratings of controllability and severity of challenging behaviour, we found no relationship between controllability ratings and IQ, consistent with earlier studies (MacKinlay & Langdon 2009; Dilworth et al. 2011). Therefore, increased control cannot explain why more able service users were rated as more angry. Alternatively, the relationship between anger and IQ could be artefactual. Some of the items on the PI refer to relatively subtle social threats that carers may feel would not be understood by less able service users (e.g. ‘being charged too much money for getting something fixed’): other things being equal, low scores on these particular items would lead to less able service users receiving a lower overall score.

The most important finding of this study was that, as predicted from earlier data (Rose et al. 2000; Rose & Gerson 2009), service users and carers use different constructs when rating the service users’ anger. Service users rate their behaviour on the basis of their internal emotional state and mental health, as reflected by their ratings of anxiety and depression, whereas carers (both key-workers and home carers) rate service users’ anger on the basis of overt behaviours, as measured by the challenging behaviour scales. As previously reported (Rose & Gerson 2009), there was a very low correlation between service-user and carer anger ratings, which in this study accounted for <3% of the variance. This is not surprising considering that the two ratings are based on differing sets of variables and perceptions.

These results have implications for the assessment of psychological well-being and the outcome of psychological interventions for people with intellectual disabilities. While staff are able to rate important changes in the lives of people with intellectual disabilities, they clearly do not have direct access to their subjective experiences. The present results support the importance of trying to access the personal experiences of people with intellectual disabilities as the most crucial element in the evaluation of an individual’s well-being, as it is clear that carers are only able to assess a small part of the information being used by the clients with whom they are working. The differences between the two sets of carers also suggest that some of the elements used by carers to rate an individual may vary between both environments and individuals, or perhaps some service users behave in different ways.
across settings (cf. Willner et al. 2005). This again underlines the importance of placing individuals at the centre of their own assessment and using carers to triangulate aspects of the assessment.

Interestingly, in the study of Rose & Gerson (2009), service-user and carer anger ratings became highly correlated ($r = 0.61$) after the service-user and carer had attended an anger management course together. On similar lines, staff supporting service users attending individual cognitive-behavioural therapy sessions made little mention of service users' inner lives or well-being when interviewed about their expectations of therapy, but showed more awareness of these issues when interviewed after the therapy (Stenfert Kroese et al. 2013). These findings suggest that carers can become more attuned to the service users' subjective experiences, but this needs some work: it does not come naturally.

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**References**


