Self-injurious behaviour and people with intellectual disabilities: Assessing the behavioural knowledge and causal explanations of care staff.

Chris Oliver¹
Scott Hall¹
Jackie Hales²
and
Donna Head³

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Address for correspondence:

Dr Chris Oliver
School of Psychology
University of Birmingham
Edgbaston
Birmingham
B15 2TT

¹School of Psychology, University of Birmingham
²Insight, Maidstone, Kent
³Dept Child and Adolescent Psychology, Westcote Centre, Leicestershire
Abstract

The Self-Injury Behavioural Understanding Questionnaire (SIBUQ) is a 27 item multiple response format questionnaire developed to examine the adoption of a behavioural perspective on self-injurious behaviour (SIB). The questionnaire comprises 3 subscales (Knowledge, Action and Causal Explanation) to which there are 6 response types designed to elucidate types of causal explanations and likely responses to SIB given particular scenarios. Test-retest reliability of the total score and response types within subscales is acceptable for most response types. The questionnaire was administered to 4 groups: contact (individuals in close contact with someone showing SIB), hospital staff (individuals in close contact with people with intellectual disabilities but not necessarily SIB), behavioural unit (individuals working on a unit for children with challenging behaviour which adopted a behavioural perspective) and behaviourally trained (individuals with formal qualifications in a behavioural approach to challenging behaviour). Comparisons between groups revealed significant differences on the total score, and all subscales. Post hoc analysis revealed that the contact group scored significantly lower than all other groups on all subscales. This group were also significantly more likely to choose a response which would reinforce SIB when considering what action to take and were more likely to impute an internal emotional type of causal explanation. An examination of the correlations between subscales revealed significant negative correlations between behavioural knowlege and the likelihood of choosing a reinforcing response and imputing internal emotional causal explanations. These findings suggest that the dissemination of a behavioural perspective to those in close contact with people who show SIB has not occurred. The implications of this conclusion are discussed with reference to the prevention and treatment of SIB.
INTRODUCTION

Self-injurious behaviour (SIB) in people with intellectual disabilities presents substantial difficulties to those who show SIB, those in close contact with people showing SIB and service providers. Prevalence rates vary, with most estimates falling between 4 and 14% (Oliver, 1993). Whilst there are a number of theories of aetiology implicating internal and external factors (Guess and Carr, 1991), learning or behavioural theories have the broadest empirical database in relation to environmental determinants, and are thus an important foundation of effective intervention (see Emerson, 1992). At the heart of the behavioural literature is an analytical approach (Remington, 1993), which demands a sophisticated understanding of theory and practice which goes beyond the mere implementation of traditional behaviour modification techniques. There are a number of reasons why staff working with people either with or at risk of developing SIB should possess such knowledge.

It is clear that for many people SIB is functional for most of the time (Iwata, Pace, Dorsey et al, 1994), function being acquired via reinforcement (Oliver, 1993). Clearly if this process of reinforcement could be interrupted, then SIB would not acquire function and be prevented. Moreover, it would be possible to avoid the strengthening of initially innocuous stereotyped behaviours or mild forms of SIB, a process which makes intervention at a later stage more problematic (see Murphy et al, 1993). Those in close contact with people with intellectual disabilities need to be aware of the risks of responding to ‘potential’ SIB in a reinforcing way and of maintaining it once it is established. For SIB to continue to exist in a repertoire, it must be reinforced or it would extinguish. It is important that those who are in close contact with people showing SIB have an understanding of the techniques which may be employed to decrease it. This is important regardless of whether they are required to design and implement the intervention or just implement it. It is, therefore, relevant to gauge the extent to which those in close contact with people showing SIB have an appreciation of a behavioural perspective, especially as specialist services and units are being replaced by more dispersed generic provision.
Understanding a behavioural perspective may be apparent from a demonstration of technical knowledge, from the causal explanations of behaviour derived and from the actions taken when responding to a person’s behaviour. Technical knowledge covers such aspects as: definitions and measurement of behaviour, the nature of reinforcement and schedules of reinforcement. Causal explanation is concerned with construing the determinants of behaviour in terms of the influence of previous contingencies, as opposed to, for example, biological or emotional factors. Action is concerned with responding in line with the interpretation of function so as to decrease the future likelihood of the behaviour. It is most likely that all three components are closely related and contribute to proficiency in understanding and implementing a behavioural perspective applied to SIB. It may be hypothesized therefore, that these three components will be significantly correlated.

It is also likely that these three components will be related to formal training. Those with behavioural training should score higher on an assessment which evaluates these components than those who are untrained. A second prediction is related to the action component. Although it is clearly important that carers do not respond in a way which reinforces SIB, theoretical models of the maintenance of socially determined SIB, predict that those in close contact with SIB will in fact do so because the presentation of the reinforcement terminates the aversive stimulus of SIB (Oliver, 1995). It is hypothesised therefore, that those in close contact with it will be more likely to respond to SIB in a way which reinforces it in the long term.

The primary aims of this study were twofold. Firstly, we aimed to develop a scale which probed technical and procedural knowledge, likely actions in response to given scenarios involving SIB and causal explanations about the determinants of SIB. Secondly, we aimed to assess the understanding of a behavioural perspective as defined by this scale possessed by people who are in close contact with SIB. A third, subsidiary, aim of the study was to examine the relationships between the three scale components.
METHOD

Participants

To fulfil the aims of the study, 4 groups were defined:

1. *Contact* group (n = 42): this group comprised people who had close daily contact with one of 5 children or adults with intellectual disabilities who showed severe SIB. Of the 42, there were 3 (7%) teachers, 7 (17%) unqualified nurses, 3 (7%) qualified nurses, 20 (48%) residential care workers, 4 (9%) teaching assistants, 3 (7%) day care workers. For 2 (5%) participants the job description was unknown.

2. *Hospital staff* group (n = 28): this group comprised hospital staff working on wards with no specified intervention perspective and with no specified level of contact with SIB, over and above that which would be expected by chance. This group had not received any particular training in a behavioural approach. Of the 28, there were 10 (36%) unqualified nurses, 12 (43%) qualified nurses, 4 (14%) day care staff. For 2 (7%) participants the job description was unknown.

3. *Behavioural unit* group (n = 17): this group comprised staff working on a unit for children with challenging behaviour which primarily adopted a behavioural approach. Of the 17, there were 9 (53%) qualified nurses and 8 (47%) unqualified nurses.

4. *Behaviourally trained* group (n = 12): this comprised individuals who had received behavioural training. Of the 12, there were 7 (58%) nurses who had completed the ENB 705 course on Behaviour Modification for nurses and 5 (42%) qualified clinical psychologists who had worked or currently worked on the behavioural unit described above.
MEASURES

The Self-Injury Behavioural Understanding Questionnaire (SIBUQ)

The SIBUQ is a 27 item multiple choice format questionnaire with 4 possible responses for each question. It is comprised of 3 subscales: Knowledge, Action and Causal Explanation, defined by the content of the items. Questions in the Knowledge subscale (n = 11) address knowledge of basic behavioural processes or techniques, such as the effects of schedules of reinforcement, defining and quantifying behaviour, defining reinforcement etc. One response is regarded as correct in line with best behavioural practice (Behavioural and Correct). Questions in the Action subscale (n = 5) each present a brief scenario describing different functional determinants of an individual’s SIB. Four alternative responses are presented and the respondent chooses one as the appropriate action to take: (i) a response likely to reinforce the SIB given the described functional determinants (Reinforcing Response), (ii) a response which would seek to avoid the situation occurring in the first place (Avoidance Response), (iii) a response which would extinguish the response in the long term given the described functional determinants (Behavioural and Correct), or (iv) a response appropriate to an organic cause (Internal Organic). Questions in the Causal Explanation subscale (n = 11) address the causal explanations of respondents in two ways. Explanation questions present a brief scenario of specific functional determinants of an individual’s SIB, whilst orientation questions are more general. In each case there are 4 types of response and the respondent chooses one: (i) a response which correctly identifies the relevant antecedents or consequences given the scenario (Behavioural and Correct), (ii) a response which recognises irrelevant antecedents and consequences given the scenario (Behavioural and Incorrect), (iii) a response which explains cause in terms of an emotional state (Internal Emotional), or (iv) a response which explains cause in terms of an internal organic state (Internal Organic). Examples of each type of question and response are shown in figure 1.

Further information about the SIBUQ is available from the first author.
The test-retest reliability of the SIBUQ was established by 12 participants in the Behavioural Unit group completing the SIBUQ on 2 occasions within a 5 day period. The reliability of the total score and the subscales is given in Table 1 together with information about the total possible scores and response types.

Reliability was good for the Total Score, the Knowledge subscale and the response type Reinforcing Response on the Action subscale. The reliability of response types on the Causal Explanation subscale are less good but at an acceptable level. Reliability for response types apart from Reinforcing Response on the Action subscale are unacceptably low. Reliability for the Internal Organic response type on this subscale could not be assessed because there was no variance in the data. These latter response types are not included in any analysis.

**Design and analysis**

The SIBUQ was administered to all members of the contact group in person when the client they were involved with was enrolled in an intervention study. For the other groups, the SIBUQ was administered by mail and respondents asked to reply within 7 days. Comparison between these groups allowed an appraisal of the validity of the measure employed. In addition, comparisons may be made between the contact group and the ‘behavioural’ groups to fulfil the second aim of the study i.e. to examine the extent to which a behavioural perspective has been adopted by those in close contact with SIB, but not working in specialist settings. Groups were compared using one way analysis of variance. A post hoc analysis of
differences between groups was performed using Tukey's Honestly Significant Difference (HSD) test.

RESULTS
Analysis of variance revealed that there was no significant difference between the groups in the length of time that members had spent working in close contact with people who have intellectual disabilities ($F(3, 88) = 1.06$, $p = 0.37$). A similar analysis was conducted for the Total Score (ie. The total Behavioural and Correct score across all subscales), the Knowledge subscale score (ie. The total Behavioural and Correct score within this subscale), all response types on the Causal Explanation subscale, and the Reinforcing Response response type on the Action subscale. The results are shown in Table 2.

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Table 2 shows significant differences between groups on the Total Score obtained, the Knowledge subscale score, the Action subscale Reinforcing Response response, and all response types on the Causal Explanation subscale except Behavioural and Incorrect. Post hoc analysis shows the source of the difference between groups on each of these measures. The contact group scored significantly lower than all other groups on the Total Score and the Knowledge subscale, and were significantly less likely to choose Behavioural and Correct responses on the Causal Explanation subscale. They were also significantly more likely than all other groups to choose the Reinforcing Response responses on the Action subscale. Both the contact group and the hospital staff group were more likely than the behavioural unit group and the behaviourally trained group to choose Internal Emotional responses on the Causal Explanation subscale. Finally, the hospital staff group scored significantly lower than the behavioural unit group and the behaviourally trained group, but not the contact group, on
the Total Score and were significantly less likely than the *behavioural unit* group and the *behaviourally trained* group to choose Behavioural and Correct responses on the Causal Explanation subscale.

A subsidiary aim of the study was to examine the relationship between causal explanations of SIB and behavioural knowledge and whether, given a scenario attributing functional qualities to SIB, a reinforcing response was chosen. Table 3 shows the results of correlational analysis.

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High and significant correlations between types of Causal Explanation and the likelihood of choosing a Reinforcing Response are evident. A high Behavioural and Correct score on the Causal Explanation subscale is associated with a low score for Reinforcing Response on the Action subscale. Conversely high Internal Organic or Internal Emotional scores on the Causal Explanation subscale are associated with a high likelihood of Reinforcing Response on the Action subscale. Knowledge shows a similar set of associations. Knowledge was significantly positively correlated with the Behavioural and Correct scores on the Causal Explanation subscale but significantly negatively correlated with Internal Organic and Internal Emotional score on the Causal Explanation subscale. Finally, knowledge is significantly negatively correlated with the Reinforcing Response score on the Action subscale. A second correlational analysis showed no significant associations between the time the participants had spent working with people with intellectual disabilities and the Total Score, the Knowledge subscale, the Reinforcing Response score on the Action subscale and any Causal Explanation subscale scores except Internal Emotional which showed a weak but significant negative correlation ($r = -0.25, p = 0.02$).
Finally, the mean scores for each job description/profession within the contact group were derived, (see Figure 2). These could not be subjected to statistical analysis as the numbers in the majority of groups were too small (see subjects). Consequently the data are only described.

Staff with job descriptions which traditionally are associated with higher levels of training, in this case teachers and qualified nurses, tended to score higher than the remaining staff. Unqualified nurses, residential care workers and teaching assistants were more likely to choose a Reinforcing Response in the Action subscale than not.

**DISCUSSION**

One aim of this study was to develop a questionnaire which could examine the adoption of a behavioural perspective in terms of procedural and technical knowledge, causal explanation of behaviour and action in response to a description of environmental determinants. There would appear to be validity to the questionnaire in terms of the *behavioural unit* and the *behaviourally trained* groups scoring significantly higher than *hospital staff* and *contact groups*. Thus there is a degree of criterion reference validity, in addition to face validity, although it should be noted that no objective measure of formal training was employed.

The test-retest reliability of the Total Score of the questionnaire and subscale scores was good, although response types in the Action Subscale apart from Reinforcing Response were too poor to be of use. Taken together these indicators of reliability and validity suggest that the questionnaire may be a useful tool for appraising the extent to which a behavioural perspective is adopted or at least understood. However, given the relatively small numbers of participants in some of the groups, the scores should not be treated as useable norms until...
further data become available. It may also be beneficial to assess the validity of the questionnaire by comparison with other similar instruments (see Carr, 1987; O'Dell, Tarler-Benlolo & Flynn, 1979).

The most pertinent finding which has arisen from this study is that those in close contact with people with intellectual disabilities who show SIB have a comparatively poor appreciation of a behavioural perspective. The scores of the contact group were significantly lower than those of all other groups. There may be a number of reasons for this. Information may not have been disseminated, service cultures may militate against adoption of a behavioural perspective or those responsible for training and dissemination may themselves be ill informed. Whatever the reason, there are a number of implications which arise from this finding. First, behavioural intervention is likely to be problematic while those responsible for implementing programmes remain unfamiliar with procedures and techniques. This may be a contributory factor to intervention failure and the discrepancy which exists between published success rates and clinical experience (see Murphy et al, 1993). Second, lack of general competence creates a reliance on external specialist services to provide needed knowledge. Third, SIB may be exacerbated by the use of inappropriate strategies. In summary, those who are charged with the responsibility of day to day care of people who show SIB have not been given the requisite skills.

More specifically, the high score on the Reinforcing Response to SIB on the Action subscale is cause for concern. If this reported response translates directly into practice, then it is clear that those in close contact with people who show SIB may tend to reinforce and maintain SIB. This finding is consistent with the results of naturalistic observational studies (Maurice and Trudel, 1982; Edelson, Taubman and Lovaas, 1983; Hall and Oliver, 1992). Respondents in this study may have chosen a Reinforcing Response as appropriate either because they were not aware of the correct response or because their experience of dealing with SIB leads them not to choose the non-reinforcing option. In either case the result is that SIB is reinforced. This result is not surprising as it is consistent with a theoretical model of the
maintenance of SIB which suggests that there is a reciprocal relationship between the short term reinforcement of SIB and the escape response followed by the other person which is itself reinforced by the likelihood of ending SIB (Hall and Oliver, 1992; Oliver, 1995).

A subsidiary aim of this study was to examine the relationship between responses to SIB and causal explanations for SIB. A causal explanation which imputes an internal emotional and organic state is correlated with the likelihood of a reinforcing response. It is possible, therefore, that causal explanations which do not acknowledge the influence of past contingencies promote responses which are ultimately detrimental. This interpretation is cautious and further research should try to elucidate whether the association is causal. It is possible that causal explanations in this case are a result of the overall level of behavioural knowledge and this is the common determinant of both causal explanations and actions.

The breakdown of Total Score and subscale scores by profession/job description in the contact group shows that teachers and qualified nurses are more likely to have adopted a behavioural perspective than other groups. Their total scores were above those of hospital staff but below those of the specialist behavioural unit staff. However these data should be treated cautiously due to the small samples involved. Whilst this finding may give rise to some optimism, it is clear that those who have similarly high if not higher levels of contact with people who show SIB, such as teaching assistants and residential care workers, score at a comparatively low level, in fact at or around chance levels (25% given a 4 item multiple choice). They also show high scores on the reinforcing response on the action subscale, as do unqualified nurses. It is critical that all who are in contact with people who show SIB are aware of the importance of their pattern of interaction.

In conclusion, it is abundantly clear from these findings that the information and skills that have been derived from research and theory have not been transmitted to those who are in contact with people who show SIB. There has been a clear failure to translate the results of research into practice and disseminate these findings to those who may make best use of
them. The outcome of this is likely to be detrimental to those who show SIB and those who are at risk of developing SIB.
References


Legends for figures and tables:

Figures.

Figure 1: Examples of items from the 3 subscales of the SIBUQ together with classification of the response types.

Figure 2: Bar chart to show the percentage score by each job description in the contact group broken down by Total Score and subscales and response types within each subscale.

Tables.

Table 1: Test retest reliabilities for the Total Score and each response type on the subscales. The total possible scores are also given.

Table 2: Mean scores and standard deviations for each group on the Total Score and the response types of each subscale. The results of the analysis of variance and a post hoc analysis are also given.

Table 3: Pearson correlation coefficients from the analysis of the relationship between knowledge, actions and causal explanations. Asterisks denote significance at $p < 0.001$. 