Development of a brief, clinically relevant, scale for measuring attachment disorders

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ABSTRACT A *17-item questionnaire for reactive attachment disorders (RAD) was developed and administered to 182 Scottish children living in foster care. The RAD questionnaire had a good test-retest reliability with an intra-class correlation (ICC) of 0.78 and inter-rater reliability with an ICC of 0.81. Cluster analysis showed that the children fell into three groups, two of which corresponded to the two reactive attachment disorder subtypes. High questionnaire scores for attachment disorders were significantly associated with conduct problems, emotional problems, hyperactivity and problems with peer relations and negatively associated with pro-social behaviour. High overall questionnaire scores for reactive attachment disorder were associated with previous sexual abuse, whereas there was no association with previous physical abuse. High scores for the disinhibited subtype were associated with previous neglect.*

Key words: reactive attachment disorder, cluster analysis, abuse, neglect

Introduction

O'Connor and Rutter (2000) have highlighted the extent to which study of reactive attachment disorder of infancy and early childhood is relatively uncharted territory. 'Diagnostic criteria for attachment disorder provide a very limited picture of the clinical phenomenology' yet parents involved in their study confirmed 'very real clinical concerns … about the child's safety and difficulties in establishing relationships with others' (O'Connor and Rutter, 2000). Both ICD-10 and DSM-IV have included attachment disorders in the psychiatric nosology (World Health Organization, 1992; American Psychiatric Association, 1992), but there are no well-validated instruments to detect them. There has been little published on the nosological validity of these clinical syndromes (Boris et al., 1998; O'Connor et al., 1999; O'Connor and Rutter, 2000) and ICD-10 states that 'there is continuing uncertainty regarding the diagnostic criteria to be applied, the boundaries of the syndrome, and whether the syndrome constitutes a valid nosological entity' (World Health Organization, 1992). Both classification systems emphasize disturbances in the child's social relatedness. In each there is a disinhibited type, which is characterized by indiscriminately friendly behaviour (disinhibited attachment disorder in ICD-10; reactive attachment disorder, disinhibited type, in DSM-IV) and an inhibited type characterized by withdrawn or hypervigilant behaviour and ambivalent social responses (reactive attachment disorder in ICD-10; reactive attachment disorder, inhibited type, in DSM-IV). Both mention grossly pathogenic care as part of the etiology, but in DSM-IV this is a diagnostic requirement (American Psychiatric Association, 1992). We will use the DSM-IV terminology.

The reactive attachment disorder, disinhibited type (AD-D) classification has developed from the theory of institutionalization (Zeanah, 1996). It is characterized, by 'an unusual degree of diffuseness in selective attachments during the first five years' and is thought to be due, in part, to the failure of opportunity to develop selective attachments because of frequent changes of caregiver (World Health Organization, 1992). The effects of institutionalization have long been noted; in 1725 a Spanish Bishop wrote 'in the

home for abandoned children, they become sad and many die of sadness' (Spitz, 1945). Various groups have demonstrated the behavioural and intellectual sequelae of institutionalization (Dennis and Najarian, 1957; Goldfarb, 1945; Vorria et al., 1998) including the 'indiscriminate' giving of affection and a tendency to go off with strangers (Goldfarb, 1945; Tizard and Hodges, 1978; Chisolm et al., 1995). Indiscriminate social relating seems to persist and is associated with inattention/hyperactivity (O'Connor et al., 1999).

The reactive attachment disorder, inhibited type (AD-I) classification has developed from observations of maltreated children in whom distorted affective communications and abnormal social interactions have been described. Examples include, 'affective withdrawal', unpredictable responses, shallow affective communication, anger or crying that does not respond to comforting (Gaensbauer and Sands, 1979) and 'approach-avoidance' where the child approaches with the head averted or by walking backwards (George and Main, 1979). One of the most significant advances in attachment theory has been the description of 'disorganized/disorientated' behaviour in strange situations (Main and Solomon, 1986), which encompasses many of the above behaviours and has been shown to be present in 80% of maltreated children (Carlson et al., 1989). Zeanah (1996) suggests that this is the only insecure category approaching pathology in its own right. There may be overlap between the disorganized/disorientated attachment *style* and reactive attachment *disorder,* inhibited type, but this is as yet unproven.

O'Connor and Rutter's (2000) landmark study has shown symptom stability for AD-D in Romanian adoptees over two years. They found that attachment disorder behaviours were correlated with attentional difficulties, conduct problems and cognitive level, yet appeared to index a distinct set of symptoms. However, the measure used by O'Connor and Rutter had only three items coding for AD-D and one item coding for AD-I and it was not, therefore, possible to study AD-I in detail. In addition, because the extreme deprivation suffered by all the children in their study had occurred in Romania, it was not possible to study associations between attachment disorders and specific forms of abuse and neglect.

There have been no studies following children with reactive attachment disorder into adulthood, but it is likely to have major public health implications. A high proportion of patients incarcerated with severe (including antisocial) personality disorder have suffered 'grossly pathogenic care' in early childhood suggesting a possible life-course progression through attachment disorder to personality disorder and criminality (Coid, 1999).

The aims of this study were threefold: to develop a useful instrument for measuring attachment disorders of both subtypes; to assess the nosological validity of the categories by examining whether children fall into groups according to the attachment disorder symptoms and to examine associations between previous maltreatment, current psychopathology and attachment disorders. Attachment disorders are thought to result from 'grossly pathogenic care' so a sample of children in foster care was chosen for the study.

Methodology

Pilot work

While the first author was working in a Guatemalan orphanage in 1992, a qualitative case study of attachment disorders in institutionalized children, aged 18 months to 17 years was undertaken. The symptoms as manifest in these children, plus the ICD-10 and DSM-IV diagnostic criteria for AD-D and AD-I, comprised the items in the original questionnaire, which was piloted with the carers of 52 children aged five to 16 attending four London child psychiatric clinics. Modifications resulted in a 22-item questionnaire, which was completed by the carers of a further 67 children aged five to 16 attending the clinics. All children referred to these clinics for assessment and/or treatment, with a history of either child protection proceedings for abuse or neglect, or of local authority care, were included in the sample. Ninety-two per cent were white, 16% currently adopted or fostered and 48% from families in social classes IV or V (main breadwinner in a partly skilled or unskilled occupation) or where the main breadwinner was unemployed. Forty-one per cent were referred by social services for psychiatric assessment, often during child protection proceedings, 35% were referred by clinicians because of aggressive behaviour and 24% for other problems including anxiety, depression, school refusal and autism. The questionnaires were used as part of the routine assessment of the children and all those asked

to take part agreed. Analysis of these data revealed that five items were highly correlated with other items and these items were therefore dropped.

Main study

The 17-item reactive attachment disorder (RAD) questionnaire developed in the pilot study was administered to a sample of 121 foster families with 182 children recruited for a randomized controlled trial of a training programme for foster carers (Minnis et al., 2001). All foster carers from 17 local authorities in central Scotland were offered entry to the trial if they were looking after children between the ages of five and 16 likely to be in placement for a further year. Foster carers also completed the Strengths and Difficulties Scale, a 25-item screening instrument for child psychopathology, which enquires about emotional, conduct, peer problems, hyperactivity and pro-social (caring, helpful) behaviour. This scale is widely used in screening and research and has been validated in over 10,000 children from the general population in the UK (Goodman, 2001). Children's social workers provided data from children's detailed case files on previous abuse and neglect.

Carers were asked to complete the RAD questionnaire a second time three to five weeks after the first administration of the questionnaire to allow assessment of the test-retest reliability. Both male and female carers independently completed questionnaires for 62 of the children and these data were used to test for inter-rater reliability.

Statistical analysis

Cluster analysis was used to explore if there were different types of attachment disorder. This is a multivariate statistical technique, which creates a classification system by producing 'clusters' or groups of highly similar individuals (Aldenderfer and Blashfield, 1984). The method has been used previously in the classification of child psychiatric disorders, for example Sevin et al. (1995).

The Ward method was used with Euclidean distances. This is a 'hierarchical agglomerative' method that sequentially merges *n* individuals into groups to minimize the total within-cluster sum-of-squared distances (see Everitt et al., 2001: 60). At first, each group contains one individual, hence there are *n* groups. Individuals are sequentially merged, until a single group appears containing all

individual results. The number of clusters therefore depends on the level of the hierarchy (Aldenderfer and Blashfield, 1984) and the success of the method depends on an *a priori* concept of what clusters are expected (Everitt, 1993). This could seem arbitrary, but if the data did not naturally cluster into the expected groupings, an unformed swarm of points in space with no obvious cluster structure would be the result.

Factor analysis was first carried out in order to reduce the complexity of the data and to achieve a sufficiently high item:subject ratio to allow valid cluster analysis. Cluster analysis was performed on the derived factor scores. Factor analysis was performed using principal factor analysis with Varimax rotation. Factor scores were derived by adding the items with high loadings on each factor and standardizing the resulting score to zero mean and unit variance. Associations between previous maltreatment or current psychopathology and scores on the RAD questionnaire (using female foster carers' scores) were studied using t-tests followed by regression analysis. Potential confounders were entered into the regression model one by one. If the magnitude of the change in questionnaire score was markedly altered by the presence in the model of the potential confounder, it was used in the final model. If not, it was left out. Only the sex and age of the child were retained. Data were analysed for female foster carers only, except where male carers were single heads of families (n = 6). Although the unit of sampling was the family, children's data were analysed and the Huber-White correction (Huber, 1967) was used to obtain robust standard errors that take into account any correlation between children living in the same family. The resulting inferences are also correct if the responses are not normally distributed or if the residual variance is not constant.

The RAD subscales were derived from the factor analysis and cluster analysis. The internal consistency of the entire scale and the two subscales was assessed using Cronbach's alpha. Inter-rater reliability among male and female foster carers as well as the test-retest reliability of the foster carers were assessed using intra-class correlation coefficients derived from one-way random effects analyses.

The factor, reliability and regression analyses were carried out in Stata and the cluster analysis was carried out in SPSS.

Results

Of the 286 families offered entry to the main study, 121 accepted (42%) with 182 children. The children were between the ages of five and 16 (mean age 11), 59% were male, 99% were white and they had spent a mean of 2.5 years with their current foster carers (range one month to 16 years). The foster families were of similar social class distribution to the general population of Scotland. There was no significant difference in social class or rate of breakdown of placements between participants and non-participants.

The factor analysis revealed four main factors (selected on the basis of eigenvalues greater than one) accounting for 94% of the variance – see Table 1. Factor 2 contains features which may describe children with disinhibited attachment disorder, but could also describe a rather anxious or immature, but otherwise normal child. Despite its relatively low loading, the item 'is demanding or attention seeking' was retained in this factor as it is clinically seen as a characteristic feature of AD-D behaviour. Further work will be required to clarify the nature of this factor. The other three factors contain features more typical of AD-I.

Cluster analysis was carried out on the four factors using the Ward method and the three-cluster solution was the most meaningful as subjects fell into groups corresponding with attachment disorder subtypes. As can be seen from Table 2, cluster 1 is dominated by Factor 2 and therefore groups cases of AD-D or anxious/immature children. In cluster 2, no particular factor dominates and this cluster groups children who do not suffer from an attachment disorder. Cluster 3 is dominated by Factors 1, 3 and 4 and therefore groups children with AD-I.

The 17-item RAD questionnaire has good internal consistency, with a Cronbach's alpha of 0.70, as do the items describing the two relevant clusters: the items describing the AD-D cluster have a Cronbach's alpha of 0.66 and those describing the AD-I Cluster, 0.70. The questionnaire scores (totalling across all questions) were approximately normally distributed. The inter-rater reliability (between independently rating foster carers) was 0.81. The intra-class correlation of the test-retest study was 0.78.

Associations between scores on RAD questionnaire and previous abuse and neglect
Ninety-three per cent of the fostered children had been abused or neglected in the past, according to social work case files. There was a significant association between attachment disorders as measured by the RAD questionnaire and sexual abuse (t = 2.52; 133 df; p = 0.01) and this remained significant after controlling, in linear regression analysis, for the child's age and sex (mean difference in RAD score with or without sexual abuse = –4.1; CI –7.5 to –0.7; p = 0.02). See Table 3.

There were no significant associations between scores on the inhibited subscale of the RAD and any form of previous abuse or neglect or between scores on the disinhibited subscale and previous abuse. There was, however, a significant association between previous neglect and scores on the disinhibited subscale, controlling for the child's sex and age (mean difference in score on disinhibited subscale = 6.1; CI 1.1 to 11.1; p = 0.016).

Associations between scores on RAD questionnaire and current psychopathology as measured by the SDQ
There was a highly significant association between scores on the RAD and scores on the SDQ, controlling for the child's sex and age ($r^2 = 0.43$; $p < 0.0001$) and the subscales: hyperactivity ($r^2 = 0.29$; $p < 0.001$); emotional problems ($r^2 = 0.33$; $p<0.001$); conduct problems ($r^2 = 0.12$; $p < 0.001$) and peer relations ($r^2 = 0.25$; $p < 0.001$). There was also a significant negative association between scores on the RAD and scores on the prosocial subscale of the SDQ ($r^2 = 0.06$; $p < 0.001$). There were highly significant associations between scores on the disinhibited and inhibited subscale and total SDQ scores ($r^2 = 0.12$; $p < 0.001$ and $r^2 = 0.51$; $p < 0.001$).

Discussion

The fact that 'high-risk' children fall into clusters according to symptoms of attachment disorders further supports the nosological validity of these categories. Our results not only provide a useful replication of the results of O'Connor and Rutter (2000) but also suggest that a wider range of attachment disorder symptoms than those described by O'Connor and Rutter and by DSM-IV and ICD-10 may warrant inclusion.

At this early stage of research into attachment disorders, it is not yet clear which symptoms are core features of the disorders and which are peripheral or part of comorbid disorders. Our strategy has, therefore, been to be include questionnaire items whose factor loadings are borderline but which are thought to be

Table 1. Factor analysis of RAD Questionnaire (n = 162).

Question	Factor loading
Factor 1	
Can be aggressive towards him/herself	0.97
Has few friends	0.97
Has no conscience	0.45
If you approach him/her you never know if he/she will be friendly or unfriendly	0.78
Factor 2	
Acts younger than his/her age	0.25
Often starts conversation	0.53
Very 'clingy'/wants to be with all the time	0.62
Is demanding or attention seeking	0.16
If you approach him/her, he.she often cuddles you	0.68
When you have been parted for a short time, he/she seems happy to see you	0.61
Factor 3	
Has no conscience	0.48
Often gives you cuddles	0.72
Is difficult to comfort when fearful/scared	0.81
Factor 4	
Tends to be afraid of new things or situations	0.37
Is often unhappy, tearful or distressed	0.54
Is apathetic/'can't be bothered'	0.84
Has no conscience	0.45
Is too friendly with strangers	0.22
If you approach him/her, you never know wether he/she will be friendly or unfriendly	0.28

Table 2. Cluster analysis on the four factors. Negative values mean that the cluster has an average lower than the overall mean.

	Factor	Mean	Standard deviation
Cluster 1	1	–0.10	0.10
	2	1.07	0.34
	3	–0.10	0.10
	4	–0.16	0.13
Cluster 2	1	–0.15	0.07
	2	–0.48	0.61
	3	0.19	0.07
	4	–0.26	0.90
Cluster 3	1	1.70	3.34
	2	0.20	1.92
	3	2.01	3.13
	4	2.89	2.16

Table 3. The association between previous abuse or neglect and foster carers' ratings of children on Reactive Attachment Disorder Scale, taking sex and age of the child into account

	Mean RAD score				
	Unadjusted RAD score with previous abuse/neglect		Unadjusted RAD score with no previous abuse/neglect		Difference in RAD score adjusted for sex and age*	p value (Wald test)
n = 135	M	sd	M	sd		
Physical abuse	18.8	9.8	17.8	9.7	–1.6 (–4.9, 1.5)	0.30
Sexual abuse	21.4	10.5	16.9	9.1	–4.1 (–7.5, –7)	0.02
Neglect	18.7	9.6	16.6	10.1	0.2 (–1.3, 1.7)	0.83
Emotional abuse	18.1	9.0	18.3	11.8	1.2 (–2.6, 4.7)	0.56

*Mean difference in RAD score (95% confidence interval) with or without previous abuse/neglect adjusted in simple linear regression analysis for the child's age and sex.

part of the core symptomatology. Some may prove to be redundant in the course of further research and clinical practice.

The results of the factor analysis are intriguing. Factors 1, 3 and 4, which we have called AD-I actually contain items typical of both the inhibited and the disinhibited type. There is clearly a lack of agreement regarding this issue in the classification systems: ICD-10 separating attachment disorders into two separate syndromes and DSM-IV grouping them but describing two subtypes. Clinicians do not appear to find any separation into disinhibited and inhibited types meaningful (Hughes, 1997) and our results suggest that there is a considerable overlap. Factor 2, which we have called AD-D, could simply describe somewhat anxious, immature but otherwise normal children. On the other hand, it could describe children who are highly disinhibited, but do not display any of the behaviours typical of the inhibited type. Our findings of a significant association between AD-D and a history of neglect and of a significant association between AD-D and behaviour problems on the SDQ suggests that the latter is true in this high-risk group. However, questions such as 'often gives you cuddles' are unlikely to distinguish between normal and disinhibited children in the general population, which underlines the difficulties in diagnosing this elusive disorder. It may be that children with attachment disorder display appropriate social behaviour but at developmentally inappropriate times. For example, often cuddling a parent when he/she approaches would be appropriate at five years, but

perhaps less so at 10 years. A clinical diagnosis will then depend on the clinician matching chronological and developmental age for these social behaviours. Recognition of these developmentally inappropriate behaviours is crucial as it is these features which may place such a child at risk of further abuse.

Using parent/carer-report to diagnose a disorder of social behaviour in which the parent/carer may play a part is potentially problematic and the question of who is best placed to report on attachment disorder behaviours is still unanswered. However it appears that parents and carers have been able to classify their children into groups corresponding to attachment disorders, as in O'Connor and Rutter (2000). Another potential rating problem is that some carers had known the child for as little as a month, but the effect of the length of the carer-child relationship on reliability of ratings could not be studied systematically in a study of this size. The accuracy with which attachment disorder behaviours can be rated by someone who is a relative stranger to the child may depend on how pervasive these behaviours are outwith the relationship with the primary caregiver. Validation of the parent/carer-report method of rating against other measures is crucial, but until the attachment disorder diagnoses become mainstream in clinical practice it will be hard to validate questionnaires against the usual 'gold standard' of clinicians' diagnoses.

The direction of causality in the association between attachment disorder symptoms and sexual abuse is not clear. Perhaps 'grossly pathogenic care' is

causal in the development of attachment disorders. Alternatively, disinhibited children may be more vulnerable to being sexually abused. A surprising result was the lack of association between physical abuse and attachment disorders. This may be due to the low variance for physical abuse and neglect in the sample, as nearly all children were known to have suffered abuse or neglect in the past. The theory suggests that a history of neglect may be more important than abuse in the etiology of attachment disorders, particularly the disinhibited type, and this appears to be borne out by our findings. However, such detailed information on early rearing patterns may not emerge using current methods of history taking in a clinical setting and this casts doubt on the usefulness of the DSM-IV requirement for 'grossly pathogenic care' in the diagnosis of attachment disorders.

The significant association between high scores for attachment disorders and high scores on all five domains of psychopathology as measured by the SDQ raises the possiblity that the RAD scale is simply measuring some kind of global index of mental distress. One hypothesis that is as yet untested is that attachment disorders are not only disorders in themselves by virtue of their negative effect on current social relationships, but also act as risk factors for a wide range of other psychopathology. Only longitudinal follow-up will elucidate the predictive validity of these disorders.

The developmental course of reactive attachment disorder is unknown. A task of future research will be to demonstrate whether or not insecure attachment *styles* are necessary for the development of attachment *disorders* as they are clearly not sufficient. Although DSM-IV focuses on under fives, Richters and Volkmar (1994) have described attachment disorders in school-aged children. Children under the age of five rarely present to child psychiatry, therefore a questionnaire measuring reactive attachment disorder in middle childhood is likely to be most useful clinically, however it would be interesting to test associations between our questionnaire and that of O'Connor and Rutter, which has been used in a younger age group. It is unlikely that the symptoms would be identical in pre-school, school-age children and adolescents and in a longitudinal study of ex-institutional adolescents, indiscriminate early attachments appeared to be replaced by attention-seeking behaviour in older children (Tizard and Hodges, 1978; Hodges and Tizard, 1989). The age at which a child experiences abuse or neglect may also be important in the emergence of attachment disorder symptoms. Epidemiological studies with larger samples are needed to elucidate the exact etiology of the disorder, its population prevalence, longitudinal course, manifestations at different ages and the efficacy of interventions.

Clinical categories are not likely to be useful unless clinicians are convinced that they describe discrete groups of children who share attributes and outcomes. This study provides more evidence that these categories do describe specific groups of children and will allow outcome studies to take place. The development of a brief questionnaire will aid the appropriate referral and treatment of children whose symptoms have proved hard to define, but whose clinical outcomes may be very poor.

Acknowledgements

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Appendix

RAD Questionnaire

Please tick the statement that best describes your child.

	Exactly like my child	Like my child	A bit Like my child	Not at all like my child	For Office Use Only
Tends to be afraid of new things or situations	☐	☐	☐	☐	☐ 1
Acts younger than his/her age	☐	☐	☐	☐	☐ 2
Is often unhappy, tearful or distressed	☐	☐	☐	☐	☐ 3
Is apathetic/ 'can't be bothered'	☐	☐	☐	☐	☐ 4
Can be aggressive towards him/herself e.g. using bad language about him/herself, headbanging, cutting etc.	☐	☐	☐	☐	☐ 5
Has few friends	☐	☐	☐	☐	☐ 6
Has no conscience	☐	☐	☐	☐	☐ 7
Is too friendly with strangers	☐	☐	☐	☐	☐ 8
Often gives you cuddles	☐	☐	☐	☐	☐ 9
Often starts a conversation	☐	☐	☐	☐	☐ 10
Very 'clingy' /wants to be with you all the time	☐	☐	☐	☐	☐ 11
Is difficult to comfort when fearful/scared	☐	☐	☐	☐	☐ 12
Is demanding or attention seeking	☐	☐	☐	☐	☐ 13
If you approach him/her, he/she often cuddles you	☐	☐	☐	☐	☐ 14
If you approach him/her, he/she often runs away or refuses to be approached	☐	☐	☐	☐	☐ 15
If you approach him/her, you never know whether he/she will be friendly or unfriendly	☐	☐	☐	☐	☐ 16
When you have been parted for a short time, he/she seems happy to see you	☐	☐	☐	☐	☐ 17
Scoring	3	2	1	0	

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