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Abstract

Population and clinical surveys of the mental health of children in foster, kinship and residential care have failed to account for a range of problems manifested by such children, largely because measurement has been restricted to standard parent-report checklists. These under-researched problems include attachment-related difficulties, anxiety and dissociative responses to trauma, age-inappropriate sexual behaviour and self-harm. The Assessment Checklist for Children (ACC) was developed to measure such problems in a prospective epidemiological study of children in long-term care. The ACC is a 120-item carer-report psychiatric rating instrument, measuring behaviors, emotional states, traits, and manners of relating to others, as manifested by children in care. Content was developed systematically, with a view to measuring all clinically significant problems experienced by children in alternate care that are not adequately measured by standard parent-report checklists. Ten clinical and two low self-esteem scales were empirically derived via factor analysis, and labeled: Sexual behavior; Pseudomature interpersonal behavior; Non-reciprocal interpersonal behavior; Indiscriminate interpersonal behavior; Insecure interpersonal behavior; Anxious – Distrustful; Abnormal pain response; Food maintenance; Self-injury; Suicide discourse; Negative self-image; and Low confidence. Initial data indicate that the instrument has good content, construct and criterion-related validity.

Keywords

Developmental psychopathology; foster care; out-of-home care; attachment disorders; Assessment Checklist for Children

Introduction

Population research with children in alternate (or out-of-home) care has focused on their presentation of commonly-observed psychopathology, as measured by standard parent-report rating scales, such as the Rutter scales (Elander & Rutter, 1996), the Child Behavior Checklist (CBCL) (Achenbach & Rescorla, 2001) and the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 2001). The reliability of foster parent reports of children's problems remains somewhat uncertain, although there is evidence that in respect of children in long-term care, foster parents are at least as reliable as parents (Tarren-Sweeney, Hazell, & Carr, 2004). To date, more than 20 studies have published CBCL scores for children in care, mostly in North America (Armsden, Pecora, Payne, & Szatkiewicz, 2000; Heflinger, Simpkins, & Combs-Orme, 2000; Horan et al., 1993; Pilowsky, 1995), while the Rutter scales have been used extensively in alternate care research in Europe (Lambert, Essen, & Head, 1977; Roy, Rutter, & Pickles, 2000; Rushton, Quinton, Dance, & Mayes, 1997; St Claire & Osborne, 1987; Vorria, Rutter, Pickles, Wolkind, & Hobsbaum, 1998; Yule & Raynes, 1972). The mental health of such children has thus tended to be framed in terms of the problems measured by these scales, specifically aggression, inattention and emotional problems, whilst relationship and trauma-related difficulties have been overlooked. Yet, this was not always so! Early accounts of children in institutional care emphasized their grossly disturbed relationship styles, accompanied by aggressive behavior, low empathy and hyperactivity (Wolkind & Rushton, 1994). This was variously described as "affectionless psychopathy" (Bender & Yarnell, 1941), "the affect hungry child" (Levy, 1937), and "institutional syndrome" (Goldfarb, 1949). More recently, research on the problems of Romanian adoptees has revived an interest in the nature of attachment difficulties and inattention / hyperactivity among infants raised in residential care (Kreppner, O'Connor, Rutter, & the English and Romanian Adoptees Study Team, 2001; O'Connor, Bredenkamp, Rutter, & the English and Romanian Adoptees Study Team, 1999).

The Rutter scales provide global estimates of psychopathology and identify emotional disorders, conduct disorders, and hyperactivity (Elander & Rutter, 1996). The CBCL similarly yields global estimates of psychopathology, as well as measures of depressive and anxiety symptoms, somatic complaints, social and thought problems, inattention / overactivity, defiance, aggression and other anti-social behavior (Achenbach & Rescorla, 2001). The scales do not adequately measure a range of problems manifested by children in care, most notably their attachment and peer relationship difficulties, dissociative and anxiety responses to trauma, self-injury and age-inappropriate sexual behavior.

The Assessment Checklist for Children (ACC) was developed for use in the Children in Care Study (CICS), a prospective epidemiological study of the mental health of children in long-term foster and kinship care, in New South Wales (NSW),

Australia (Tarren-Sweeney & Hazell, 2005, 2006). The ACC was designed to measure those problems manifested by children in care, which are not adequately measured by the CBCL (which was also administered in the study), including low self-esteem. While a number of instruments measure relevant problems, such as attachment disturbances (Minnis, Rabe-Hesketh, & Wolkind, 2002), dissociation (Steinberg, 1996), and sexual problems (Friedrich, Grambsch, Broughton, Kuiper, & Beilke, 1991), no single instrument was suitable for the task. The ACC was also designed for use in clinical assessments of children in care, addressing a need for more comprehensive and specific clinical data (Garwood & Close, 2001). The present paper describes the ACC's development and initial validation.

Development of clinical content

Clinical and self-esteem items were developed separately. The ACC's clinical content was derived systematically over several years, using a combination of deductive and inductive strategies. The aim was to identify all clinically significant problems experienced by children in alternate care, which are not adequately measured by the CBCL. Deductive, or content-based strategy, is "...based on à priori or theoretical conceptions of the behavioral or personality domain that the instrument is being designed to measure ..." (Aiken, 1996). In applying a deductive strategy, items are designed to measure pre-determined constructs. An example would be the development of a diagnostic screening interview. By contrast, inductive (or empirical) strategy is applied without presumption of underlying constructs. Instead, clinical content is identified at the level of individual behaviors or symptoms, and syndromes are identified from statistical analysis of large item sets (Aiken, 1996; Burisch, 1984). Research on the mental health of maltreated children has been limited, and little is known about the phenomenology of problems manifested by children in care. Hence, a purely deductive approach would fail to locate some relevant problems. Conversely, it was thought that content derived inductively could be biased because of the relatively small scale of the project (e.g. via selection bias, responder bias, or location bias). Hence, a combination of deductive and inductive strategies was employed to maximize the validity and comprehensiveness of the selected content. These strategies are set out below.

Although children and young people in residential care were not included in the CICS, the ACC's content refers to difficulties manifested by them. At the time the ACC was developed, all large residential facilities were disestablished in NSW (as part of a reform of alternate care). Consequently, most children and young people who formally would have been placed in residential care (because of disruptive behavior and serial placement breakdown) remained in high-needs foster placements. This partly accounts for the high rates of mental health disturbances detected in the CICS foster care cohort (Tarren-Sweeney & Hazell, 2006). Prior to closure of the facilities, many of the

clinicians who contributed to the development and review of ACC content (including the author) had worked extensively with children in residential care.

Step 1: Review of clinical assessment reports

Clinical assessment reports of children residing in foster, kinship and residential care, as well as those of maltreated children, were perused for references to individual behaviors, and for diagnostic terms. In all, 110 assessment reports were sourced from 50 psychological records of children who either were, or had been in care, or who were child protection clients. The assessments were conducted by psychologists and psychiatrists working in specialist public health services, child welfare services, private fostering agencies, and private practice. Twenty-seven items of problem behavior were identified in this way. The most commonly listed diagnoses were disruptive behavior disorders and attachment disorders.

Step 2: State-wide survey of clinicians

Forty-seven clinicians (Psychiatrists and Psychologists) who worked extensively or exclusively with NSW children in care and / or maltreated children were asked to: (i) list mental health problems they had encountered among such children, which are not adequately measured by the CBCL; and (ii) comment on 27 proposed items. Seventeen clinicians responded to the survey, most providing detailed written or verbal feedback. Responses endorsed each of the proposed items (as being both relevant and maladaptive), and generated an additional 22 items. They consistently emphasized the presence of attachment difficulties among the target children.

Step 3: Literature review

A review of literature describing the mental health of maltreated children, and of children in foster, kinship and residential care, was performed. Types of psychopathology that are known to be over-represented among target children were also reviewed (e.g. attachment disorders, dissociation, posttraumatic stress disorder), so as to identify the component symptoms.

Step 4: Development of a conceptual framework

There was considerable concordance in the problems identified in the field versus those described in the literature. Exceptions to this were abnormal eating (barely mentioned in the literature), and symptoms of post-traumatic stress disorder (infrequently identified by clinicians, or in assessment reports). Both sources highlighted the pervasiveness of attachment difficulties among the target children. From the information collated to this point, a conceptual framework was developed in the form of hypothesized symptom clusters (see Table 1). This framework prompted the inclusion of another 60 items.

[insert Table 1 about here]

Step 5: Review by foster parents

A 129-item draft instrument was constructed for use in the CICS pilot study. This version was reviewed by a focus group of fifteen experienced foster parents. The group endorsed the ACC's readability and item validity, and they thought the user instructions were clear. They were also asked whether foster parents might be offended or distressed by any content, notably the sexual behavior and self-injury items. They argued that, in the context of a clinical assessment or research, foster parents would typically feel affirmed or relieved when reading such content, since it describes real problems that they have to contend with. The group proposed three additional items, and revisions to five items.

Step 6: Review by clinicians

A 132-item research version of the ACC was constructed for the CICS baseline survey. This version was reviewed by a group of ten experienced child and family Psychologists, who worked primarily with children in foster and kinship care and with maltreated children. Many of the reviewers had also worked with children in residential care, and three were respondents in the clinician survey. They also endorsed the items' readability and validity, as well as the user instructions. No additional items were proposed.

Development of self-esteem content

Items measuring *low self-esteem* were developed separately from clinical content, using a different procedure. Twenty carer-report items were designed to measure low self-esteem constructs derived from the Coopersmith Self-esteem Inventory – School Form (CSEI) (Coopersmith, 1981). The CSEI is a valid and reliable child self-report instrument, designed to "... measure evaluative attitudes towards the self in social, academic, family, and personal areas of experience ..." (Coopersmith, 1981) Of 58 items, 26 purport to measure *general* self-esteem, that is, descriptors of self-image and self-confidence that are not specific to a single setting (such as school or home). An analysis of the meaning of the general items suggests they measure: low versus high self-worth; negative versus positive self-image; adjustment to change; self-confidence; and perceived competence, dependability, decisiveness and persistence. Twenty carer-report items were designed to measure these constructs in the ACC.

Checklist format

The ACC is a 120-item carer-report psychiatric rating scale, administered in two parts. Each item refers to an individual behavior, emotional state, trait, or manner of

relating to others, that is observable by a child's carer. There are separate versions for boys and girls, allowing for use of gender-specific personal pronouns (him/her, himself/herself, he/she). Items are otherwise identical for boys and girls.

Response scale

The ACC employs a three-point response scale (0-1-2), similar to the Revised Rutter Scales ("does not apply", "applies somewhat", "certainly applies") (Hogg, Rutter, & Richman, 1997), the CBCL and its companion instruments ("not true", "somewhat or sometimes true", "very true or often true") (Achenbach & Rescorla, 2001), and the Strengths and Difficulties Questionnaire ("not true", "somewhat true", "certainly true") (Goodman, 2001). Achenbach argues that a three-option scale is preferable to a dichotomous scale, because untrained raters (i.e. parents) have more difficulty in responding to a 'present / absent' scale (Achenbach, 1991; Achenbach & Edelbrock, 1978). Conversely, finer differentiations than that offered by three options are more vulnerable to bias by respondent characteristics (Achenbach, Howell, Quay, & Connors, 1991), and do not provide greater discrimination between mental health syndromes (Achenbach & Edelbrock, 1978). A 3-point scale was also selected to ensure the ACC and CBCL item scores had a common metric for pooled data analysis.

Measurement of infrequent critical events

The ACC was designed to detect infrequent events of critical problems such as suicide attempts and discourse, age-inappropriate sexual behavior, and self-injury. Detecting single or isolated behaviors is important if they are markers for risk of harm, or if the events have clinical significance. Conversely, it is not useful to detect isolated instances of less critical problems, such as peer conflict. The ACC differentiates between these two types of items by assigning them to separate parts, each of which employs a different three-step response scale.

Part 1 uses the following instructions for less critical / higher incidence problems:

- "Circle 0 if the statement is not true for your child, in the last 4 to 6 months"
- "Circle 1 if the statement is partly true for your child, in the last 4 to 6 months"
- "Circle 2 if the statement is mostly true for your child, in the last 4 to 6 months".

Part 2 uses the following instructions for more critical / lower incidence problems:

- "Circle 0 if the behavior did not occur in the last 4 to 6 months"
- "Circle 1 if the behavior occurred once in the last 4 to 6 months"
- "Circle 2 if the behavior occurred more than once in the last 4 to 6 months".

Timeframe instruction

In the context of the present study, the CBCL's timeframe *now or within the past 6 months*, might unduly confuse respondents. Temporary and short-term foster carers

have less opportunity to observe their foster child's behavior. In clinical practice, foster parents often query the CBCL timeframe if they have known the child for less than six months. It was also thought that the word "now" might confuse respondents in Part 2, where an item is scored if the behavior occurs only once within the timeframe. Hence it was decided that the timeframe instruction should be *in the last 4 to 6 months*.

Item and factor analyses

Sample

Item and factor analyses were performed on ACC scores for 412 children in long-term care in NSW, obtained via three sources: the CICS baseline survey (n=347) (Tarren-Sweeney & Hazell, 2006); the CICS pilot study (n=33); and clinic referrals (n=32). The latter scores were obtained in clinical assessments conducted by the author. The children ranged in age from 4 to 11 years, but more than 60% were 6 to 8 years old. Gender was evenly distributed (209 boys, 203 girls). Proportions of children residing in metropolitan Sydney, in other metropolitan locations, and in regional and rural locations were 30%, 26% and 44% respectively. The children were highly disadvantaged in terms of their exposure to social adversity. On average they experienced 3.5 confirmed maltreatment events, with 1.6 years elapsing between the first recorded event and their entry into care. Fewer than 6% (n = 20) entered care without documented maltreatment, for reasons including: being at high risk of harm (mainly new-born babies); being abandoned; or being surrendered to care. The children's mean age at entry into care was 3.5 years; mean time in care was 4.3 years; and their median and mean number of placements was 2 and 3.1 respectively.

Item analysis

A nominal total clinical score was generated from the sum of clinical item scores, and item-total correlations were calculated. All item-total correlations were positive, with 83% exceeding $r = 0.30$, and 27% exceeding $r = 0.50$. Five low prevalence items correlated less than $r = 0.20$. The procedure was repeated for low self-esteem items.

Thirty-two items had a gender ratio of item mean scores greater than 1.5 (boy > girl = 16 items; girl > boy = 16 items). Four items had item-age correlations between 0.20 and 0.30, and 29 items had item-age correlations between 0.10 and 0.20, most of which were positive (i.e. older children scored higher). However, these age effects were largely accounted for by children's age at entry into care, which was a confounder. The confounding also suppressed negative correlations.

Item prevalence, defined as the proportion of the sample scoring either 1 or 2, ranged from 0.8% ("attempts suicide") to 74% ("easily influenced by other children"). Six items had greater than 50% prevalence. While these problems may thus be normative for children in care, they are maladaptive (each loaded on a factor measuring indiscriminate interpersonal behavior), and are unlikely to be normative among children

at large. Hence they were not discarded. Seventeen items had less than 5% prevalence (referred to as *low prevalence* items), including three sexual behavior items with less than 3% prevalence. The latter three items were excluded from subsequent analyses and deleted from the checklist, because their inclusion did not increase the detection of children with sexual behavior problems (as indicated by a nominal sexual behavior score). The remaining 129 items were retained for factor analyses.

Factor analysis of clinical items

Two preliminary analyses were conducted to locate items that load weakly on various models, with a view to maximizing the subject to item (STI) ratio. In these analyses, a 10-factor model yielded the most stable and meaningful factors, while an 11-factor model yielded a weak *dissociation from reality* factor. Items were withheld from the main analysis if they loaded less than 0.35 on any of the 10 factors, and if their exclusion did not notably alter the factor structure of the retained items. Sixteen items did not load sufficiently (less than 0.35) on any factor, and were withheld from the main analysis. Five low prevalence items were also withheld from the main analysis.

Eighty-eight items were included in the main factor analysis, providing a STI ratio of 4.7. The sample size was insufficient to perform separate analyses for each gender. Twelve factors were retained after performing a scree plot test, each of which had an eigenvalue greater than 1.5. Oblique (promax) rotations were then performed on models of 6 to 12 factors. Again, the rotated 10-factor model yielded the most precise and clinically meaningful factors. Larger models produced additional, meaningless factors, while smaller models merged distinct constructs.

Two supplementary analyses were performed. A factor analysis of 92 items was conducted to estimate factor loadings for 7 low prevalence sexual behavior and self-injury items, which had been excluded from the main analysis. An exploratory analysis was also conducted on a pool of 81 items, to examine the factor structure obtained with a STI ratio greater than 5. Increasing the STI ratio did not alter the factor structure. The ten factors describe the following problems: (i) age-inappropriate sexual behavior; (ii) precocious, pseudomature interpersonal behavior, including role-reversal; (iii) emotionally inhibited, non-empathic, and controlling interpersonal behavior; (iv) indiscriminate, disinhibited interpersonal behavior; (v) insecure, withdrawn and overly conforming interpersonal behavior; (vi) anxious, distrustful behavior; (vii) abnormal responses to pain; (viii) food maintenance behavior; (ix) self-injurious and related behaviors; and (x) suicidal behavior and discourse.

Factor analysis of low self-esteem items

A preliminary factor analysis examined the factor structure of the combined pool of low self-esteem and clinical items. Eighteen of the 20 low self-esteem items loaded predominately on two self-esteem factors, in a 12-factor model, while the other two

items loaded on clinical factors. The latter two items were not retained for further analysis, and were deleted from the checklist. A principal components factor analysis with oblique rotations was then performed on the 18 retained low self-esteem items. This yielded a coherent and meaningful two-factor model of low self-esteem. The two factors were quite distinct, with all but one item loading > 0.60 on one factor, and < 0.20 on the other factor (see Appendix 1). These factors represent constructs of *negative self-image* and *low confidence*.

Scale construction

Clinical and low self-esteem scales were derived from items loading above pre-determined values on the respective 10- and 2-factor models. Items were not shared across scales. Initial requirements were that: (i) the correlation between prospective items and all other items in a notional scale (item – rest correlation) should exceed $r = 0.30$; and (ii) an item's presence should not lower the internal consistency of a scale. Items were then assigned to the relevant scale if they loaded ≥ 0.30 on a single factor ($n = 81$), while items loading ≥ 0.35 on two factors were assigned to the scale with the highest factor loading ($n = 9$). There were a few exceptions to this. The item “fears he / she might be molested” was assigned to the “anxious – distrustful” scale, despite loading somewhat higher on the “sexual behavior” factor. The item “low self-esteem” was not assigned to either of the self-esteem scales. Finally, four items loading on the “indiscriminate interpersonal behavior” factor were not assigned to the scale, because they refer to inattention more than interpersonal behavior. It is known that inattention is a correlate of indiscriminate attachment among children in care (Green, 2003; Kreppner et al., 2001). Yet, it was thought that including inattention in this scale would make clinical interpretation difficult for future users.

In all, fourteen items included in this research version of the ACC were subsequently deleted, and ten were retained as “other items” (i.e. contributing to total scores, but not assigned to scales). Two new items were written to measure sexual behavior that is more likely to occur in adolescence. The final version of the ACC thus contains 102 clinical items and 18 low self-esteem items. The scales are listed with their constituent items in the Appendix.

Scale properties

Non-putative labels

The naming of scales is problematic, as it can inadvertently infer causality, or underlying theoretical constructs. Non-putative terms were selected because the scales were largely derived empirically, and because maltreatment and attachment syndromes are as yet inadequately conceptualized. For example, “abnormal response to pain” was used in preference to “pain dissociation” or “pain agnosia”, since the latter terms imply specific mechanisms.

The clinical scales were labeled:

- i. Sexual behavior
- ii. Pseudomature interpersonal behavior
- iii. Non-reciprocal interpersonal behavior
- iv. Indiscriminate interpersonal behavior
- v. Insecure interpersonal behavior
- vi. Anxious – Distrustful
- vii. Abnormal pain response
- viii. Food maintenance
- ix. Self-injury
- x. Suicide discourse

The low self-esteem scales were labeled:

- i. Negative self-image
- ii. Low confidence.

Relationships between clinical scales

A correlation matrix of the ACC clinical scales is presented in Table 2. The clinical scales are numbered I to X in the order that best reflects inter-scale correlations. As anticipated, scores on the interpersonal behavior scales were moderately correlated, while scores on the lower prevalence scales (“abnormal pain response”, “food maintenance”, “self-injury”, and “suicide discourse”) correlated less with other scales. Correlations of clinical scale scores and the total clinical score ranged from $r = 0.38$ to 0.83.

A principal components factor analysis conducted on the 10 clinical scale scores indicates the instrument has no higher-order factor structure (such as *internalizing* versus *externalizing* factors).

[insert Table 2 about here]

Optimal cut-points for ACC total clinical scores

Relationships between ACC total score distributions and various indicators of psychiatric impairment ($n = 347$) were examined for the CICS baseline cohort ($n = 347$), with a view to identifying clinically significant scores. The indicators were: CBCL total problems scores in the clinical range; CBCL total problems scores in the borderline plus clinical ranges; child reported to have a psychiatric diagnosis; child reported to have received counseling or psychotherapy in the previous year; carer received professional advice on managing child’s behavior or emotions; and child presently prescribed psychotropic medication. Sensitivity and specificity were plotted for each criterion in Receiver Operating Characteristics (ROC) analyses, using STATA

(Statacorp, 2003). Optimal cut-points for each analysis were identified by balancing two objectives: 1. that the cut-point maximizes the number of children correctly identified; and 2. that the cut-point has roughly equal sensitivity and specificity. The results of these analyses (listed in Table 3) suggest there are no substantive gender differences in clinically significant scores, meaning the same clinical cut-points can be applied to both genders. Two cut-points were selected to identify children with clinically significant mental health problems. First, ACC total scores of 27 and above constitute a clinical range that is highly predictive of psychiatric impairment. Second, ACC scores in the range of 21 to 26 constitute a borderline clinical range, indicating a moderate likelihood of psychiatric impairment. Although neither cut-point incurred an unreasonable compromise between specificity and sensitivity, the clinical range is highly specific (resulting in few false positives), and the borderline plus clinical range is highly sensitive (few false negatives). For example, for predicting CBCL total problems scores in the clinical range, the sensitivity and specificity of the ACC clinical cut-point (score = 27) were 83% and 91% respectively, while the sensitivity and specificity of the borderline cut-point (score = 21) were 91% and 79%.

[insert Table 3 about here]

Initial validation

Content validity

The ACC's content was derived systematically over several years, with a view to identifying clinically significant behavior manifested by 4 to 16 year-old children in foster, residential and kinship care that is not adequately measured by the CBCL. The instrument's content is both comprehensive and valid. It was derived using a combination of inductive and deductive strategies, including the development of a conceptual framework. The validity of the content was reviewed by experienced clinicians and foster parents, prior to inclusion in the CICS baseline survey. Content was also subjected to item and factor analyses, resulting in deletion of some items. Item content can therefore be considered valid for 4 to 16 year-olds in various forms of alternate care, including residential care.

Construct validity

The construct validity of the ACC is strongly supported by estimates of factorial and concurrent validity, obtained in the pilot and baseline surveys of the CICS. The clinical scales were empirically derived from factor analyses. Various analyses revealed a stable factor structure, with most items loading strongly on a single factor. The proportion of the clinical item score variance explained by the 10-factor model (88 items, 49%) is comparable to that reported for other carer-report checklists (Achenbach, 1991; Connors, Sitarenios, Parker, & Epstein, 1998; Dekker, Nunn, Einfeld, Tonge, & Koot, 2002; Goodman, 2001). Moreover, each scale appears conceptually coherent i.e. the

factors appear to be clinically meaningful, with few items being ‘out of place’. Most of the scales approximate syndromes described in the literature.

To possess construct validity, an instrument should correlate highly with measures of similar or allied constructs, and inversely with measures of opposing constructs (Aiken, 1996). The ACC and CBCL measure constructs that in many instances are phenomenologically related (e.g. indiscriminate attachment problems with inattention; inhibited attachment problems with aggressive behavior). It is thus anticipated that a child in care who demonstrates high scores on one instrument would likely have elevated scores on the other. The instrument’s validity is supported by high correlations of ACC and CBCL total clinical scores (boys: $r = 0.89$; girls: $r = 0.90$) in the CICS baseline survey. This also suggests the ACC total clinical score is a valid measure of global psychopathology for children in care. Concurrent validity is further demonstrated by strong associations between ACC clinical scale scores and the CBCL total problems score. In a linear regression, the 10 clinical scale scores accounted for 80% of the CBCL total score variance (adjusted R squared), with seven scales being independent predictors. Consistent with prior findings of an inverse relationship between children’s social competence and problem behavior (Achenbach & Rescorla, 2001), all boys’ and girls’ ACC scale scores were negatively correlated with CBCL social competence scores in the baseline survey.

Criterion-related validity – “Sensitivity to Risk”

The ACC appears to be sensitive to children’s complex exposure to multiple risk factors, with clear evidence of dose-response relationships. In predictive modeling of baseline data ($n = 347$), developmental, pre-care and in-care risk factors predicted a high proportion of the variance in children’s attachment problems (adjusted R squared = 0.29), as measured by a composite of the ACC pseudomature, non-reciprocal and indiscriminate scale scores. The same factors predicted between 15% and 29% of the variance of scores on each of the four interpersonal behavior scales, the sexual behavior scale and the anxious-distrustful scale. These factors also accounted for identical proportions of the variance of ACC and CBCL total scores (adjusted R squared = 0.31).

Criterion-related validity – “Referral / diagnostic status”

An important measure of a clinical instrument’s validity, is its ability to differentiate between referred and non-referred children (Achenbach, 1991; Achenbach & Rescorla, 2001). The CICS surveyed several indicators of clinical service use, namely: children’s engagement in counseling or psychotherapy in the previous year; psychotropic medication use; and provision of clinical advice to carers (such as behavior management). However, these indicators don’t neatly equate to referral status, since children in care often receive clinical services for reasons other than treatment of mental health problems (such as sexual assault counseling). There were also sizeable numbers

of children and carers who had unsuccessfully sought access to clinical services. Hence in this sample, children's *diagnostic status* may represent a better mental health criterion than their *referral status*. Nonetheless, there were substantial differences in ACC scale scores stratified by referral, medication and diagnostic status. Group effect sizes, listed in Table 4, indicate that the ACC adequately differentiates between referred and non-referred children in care.

Reliability

Internal consistency was high, with Cronbach's alpha = 0.96 for the total clinical score, and ranging from 0.70 to 0.86 for the clinical scales (see Table 5). This is comparable to that of the CBCL (Achenbach & Rescorla, 2001) and the Conners Parent Rating Scale (Conners et al., 1998), and exceeds that of the SDQ (Goodman, 2001). External reliability checks have yet to be conducted, but are planned for forthcoming validation studies.

[insert Tables 4 and 5 about here]

Discussion

The number of subjects in the present sample ($n = 412$) was sufficient to extract a stable factorial model, though the STI ratio was somewhat low at 4.7. Various rules of thumb have been used to determine an adequate sample size for exploratory factor analysis, including minimum sample sizes of 100 and 200 subjects, and having a minimum STI ratio of 4 or 5 (Bryant & Yarnold, 1995; Floyd & Widaman, 1995). It has been argued that such rules of thumb are arbitrary, and that the stability of a factor analysis is more dependent on how strongly the items load on the factors (Floyd & Widaman, 1995; Guadagnoli & Velicer, 1988). In the present analyses, items generally loaded well on the various factors, and the factor structure appears to be stable. The structure did not vary in a proxy factor analysis performed on a reduced item set (with an STI ratio of 5.1).

The validation procedures conducted to date, suggest the ACC has good content and construct validity. Predictive validity, long-term stability, and the factor structure of adolescent scores will be estimated in the CICS follow-up survey. Other planned checks include estimates of convergent validity, gender-specific factor analyses, various criterion-related measures (differentiation between children in care, maltreated children and children at large), test-retest reliability, and inter-rater agreement. These checks are to be conducted in forthcoming studies of: older children in special needs foster placements; clinic-referred children stratified by care history and exposure to maltreatment; and children at large with no care histories.

The development of the ACC was not without limitations. The inductive strategies employed in content development were comprehensive, but were conducted on a relatively small scale. The items may thus reflect some degree of information bias. The

extent to which children in care in NSW resemble equivalent populations in other parts of the world is not clear. Mean CBCL scores of children in the CICS baseline study (Tarren-Sweeney & Hazell, 2006) were at the upper limit of estimates reported for other studies of children in foster and kinship care (Heflinger et al., 2000). The sample is likely to differ from children in foster or kinship care in other jurisdictions or countries, because institutional care is no longer provided in NSW (high needs children are fostered instead), and because few children enter long-term care without some history of maltreatment.

The present findings shed some light on the phenomenology of emotional and relationship difficulties experienced by children in care. Inhibited and disinhibited forms of attachment disturbance were hypothesized in the conceptual framework, and scales paralleling these phenomena (*non-reciprocal* and *indiscriminate* interpersonal behavior) were derived through factor analysis. It is likely that high scores on these scales represent, in most instances, socially determined attachment disturbances. Indeed, it was found that scores on these scales were most strongly predicted by children's exposure to social adversity, and their age at entry into care. However, in some instances, problems with social relatedness may reflect brain injury, intellectual disability, autistic spectrum disorders, or temperament (Richters & Volkmar, 1994). The author has also observed cases in which non-reciprocal interpersonal behavior is situation-specific. For example, these difficulties may be apparent in a child's relationship with their foster parents, but not with their birth parents. The emergence of the "pseudomature" factor had not been anticipated. This pattern of interpersonal behavior has been described previously (Lieberman & Zeanah, 1995), but is not conceptualized as a form of attachment disturbance. The meaning and clinical significance of pseudomature behavior requires further investigation.

Current conceptualization of inhibited and disinhibited attachment disorder behaviors is that they are manifested as discrete forms of disorder. Yet, it has recently been suggested these sub-types may not be symptomatically distinct (Minnis & Keck, 2003). The present findings strongly support the latter view, with children's scores on the "pseudomature", "non-reciprocal" and "indiscriminate" scales being at least moderately correlated. Very few children presented with 'pure' patterns of attachment difficulties. The findings thus suggest that children in care with impaired social relatedness present with an attachment disorder *profile*, rather than discrete sub-types.

What of other relationship difficulties? A "peer problems" factor was not identified in the factor analysis, despite the inclusion of several peer relationship items. The present results support the view that severe peer problems do not constitute a unitary clinical construct, but instead are manifestations of different attachment styles and difficulties. (Hodges & Tizard, 1989). The conceptual framework also referred to insecure, anxious attachment behavior, which is somewhat akin to the items in the "insecure" scale. However, the "insecure" scale does not delineate between *state* and *trait* insecurity.

Insecure and overly conforming behaviors may indicate an insecure attachment style, but equally may represent a child's adaptation to previous losses (including foster placement breakdowns). It may even represent an adaptive response to residing in an authoritarian foster placement. Hence, high scores on the "insecure" scale may be difficult to interpret in the absence of contextual information.

The score distributions of dissociative items were intriguing. Four items describing dissociative-like responses to pain clustered on an "abnormal pain response" factor. However, a hypothesized cluster of "dissociative responses to trauma", which ostensibly refers to dissociation from identity or reality, was not validated. Instead a weak "dissociation from reality factor" was identified in larger models, consisting of the three items "has an imaginary friend", "has blackouts or periods of amnesia", and "thinks he/she is someone or something else". These were retained as "other items".

A "suicide discourse" factor was identified in the analysis, from suicide-related behaviors observed among only a handful of children. The validity of the scale needs to be tested with older children who have a higher incidence of suicidal behavior and discourse. Relationships between various forms of self-harm and other behaviors were also intriguing. An interesting aspect of the "self-injury" scale is that overt self-injury clustered with quasi autistic / emotional disturbance features (rocking, pica, and unhealthy drinking). Contrary to expectation, risk-taking behavior correlated more closely with inattentive and indiscriminate interpersonal behavior, than self-harm. Previously reported analyses of ACC and CBCL food and eating items revealed two distinct patterns of aberrant eating among children in care (Tarren-Sweeney, 2006). The first is a pattern of excessive eating and food acquisition and maintenance behaviors without concurrent obesity (termed *Food maintenance* syndrome), resembling the behavioral correlates of Hyperphagic Short Stature (Psychosocial Dwarfism). The second is a cluster of pica-type eating behaviors that correlates with self-injurious behavior, and is closely associated with developmental disabilities.

Finally, the sharp distinction between low confidence and negative self-concept challenges the notion that low self-esteem is a unitary construct, at least when applied to this population.

Conclusion

The Assessment Checklist for Children was designed as a carer-report psychiatric rating scale for epidemiological and clinical research with children in care, either as a standalone measure, or as a complementary instrument to the CBCL. Initial data indicate that the ACC has good content, construct and criterion-related validity. Comprehensive survey estimates of the mental health of children in care can be obtained using the ACC in parallel with the CBCL. It also provides a means of studying the characteristics and determinants of complex psychopathology. Researchers who are interested in using the ACC should contact the author.

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Table 1 Hypothesized symptom clusters for 132-item ACC (initial research version)

Symptom clusters	# of items
Abnormal sexual behavior	15
Self-injury, risk-taking and suicidal behavior	20
- Self-injury	12
- Risk-taking	3
- Suicide	5
Anxiety responses to trauma	12
Dissociative responses to trauma	6
Other maladaptive responses to physical abuse	9
Food / eating problems	9
Attachment difficulties (insecure or disordered attachment)	
- Inhibited, avoidant interpersonal behavior	13
- Disinhibited, over-familiar interpersonal behavior	11
- Insecure, anxious attachment behavior	8
Peer relationship difficulties	14
Total clinical items^a	112
Self-esteem items	20

^a 5 items were listed under two clusters

Table 2 Correlation matrix of ACC clinical scales (n=412)

Sexual behavior	.64																			
Pseudomature	.74	.49																		
Non-Reciprocal	.82	.50	.57																	
Indiscriminate	.79	.50	.57	.56																
Insecure	.83	.40	.58	.63	.61															
Anxious – Distrustful	.70	.43	.50	.49	.43	.60														
Abnormal Pain Resp	.58	.31	.34	.49	.36	.43	.31													
Food Maintenance	.57	.24	.35	.43	.41	.38	.39	.29												
Self-Injury	.57	.23	.25	.36	.38	.35	.36	.39	.44											
Suicide Discourse	.38	.23	.25	.25	.20	.24	.33	.15	.28	.40										
	Total Clinical	Sexual Behavior	Pseudomature	Non-Reciprocal	Indiscriminate	Insecure	Anxious - Distrustful	Abnormal Pain Response	Food Maintenance	Self-Injury										

Table 3 Receiver Operating Characteristics (ROC) of ACC total score as screen for various clinical outcomes

	Boys (n = 176)				Girls (n = 171)			
	Optimal score	% Correct ^a	AUC ^b	95% C.I. ^c	Optimal Score	% Correct	AUC	95% C.I.
CBCL clinical range								
Total problems clinical range ^d	25	88%	.95	.92 - .98	23	89%	.95	.91 - .98
Total problems borderline ^e	21	85%	.93	.89 - .96	22	88%	.94	.90 - .97
Any scale in clinical range ^f	22	86%	.93	.89 - .96	22	88%	.94	.91 - .98
Clinical service use								
Reported diagnosis ^g	25	69%	.76	.68 - .83	27	73%	.76	.67 - .84
Counseling / Psychotherapy ^h	21	67%	.71	.63 - .79	25	75%	.79	.72 - .86
Professional advice to carer ⁱ	23	61%	.63	.55 - .71	22	63%	.64	.55 - .72
Counseling + advice ^j	27	58%	.63	.55 - .72	27	67%	.72	.63 - .81
Psychotropic medication ^k	29	60%	.62	.52 - .72	32	65%	.71	.58 - .85

^a Percent of scores that correctly classify criteria^b Area under the curve (AUC)^c 95% confidence interval of AUC^d CBCL total problems score in the clinical range (yes, n = 167; no, n = 180)^e CBCL total problems score in the borderline + clinical range (yes, n = 195; no, n = 152)^f Any CBCL scale score (broadband or sub-scale) in the clinical range (yes, n = 191; no, n = 156)^g Reported as having a prior diagnosis of an emotional, behavioral or psychiatric disorder (yes, n = 131; no, n = 209)^h Received counseling or psychotherapy in previous year (yes, n = 152; no, n = 191)ⁱ Carer received professional advice re. management of child's behavior or emotions (yes, n = 158; no, n = 189)^j Received counseling or psychotherapy and carer received professional advice (yes, n = 107; no, n = 236)^k Child presently prescribed psychotropic medication (yes, n = 57; no, n = 290)**Table 4 Effect sizes (*d*)^a of reported diagnostic status and clinical service use on ACC scale scores**

	Reported diagnosis ^b (n = 131)	Counseling / Psychotherapy ^c (n = 152)	Behavior advice ^d (n = 158)	Psychotropic medication ^e (n = 57)
Sexual behavior	.42	.52	.24	.34
Pseudomature	.53	.73	.23	.18
Non-reciprocal	.83	.77	.34	.57
Indiscriminate	.68	.59	.28	.28
Insecure	.52	.76	.31	.32
Anxious – distrustful	.43	.53	.35	.25
Abnormal pain response	.62	.40	.30	.57
Food maintenance	.58	.44	.25	.30
Self-injury	.60	.45	.34	.24
Suicide discourse	.45	.44	.41	.03
Total clinical	.83	.84	.42	.49

^a Effect size reported as standardized difference between mean scores (Cohen's *d*) i.e. the difference between group mean scores expressed as a proportion of the standard deviation of scores for the aggregate CICS sample^b Reported as having a prior diagnosis of an emotional, behavioral or psychiatric disorder^c Received counseling or psychotherapy in previous year^d Carer received professional advice re. management of child's behavior or emotions^e Child presently prescribed psychotropic medication

Table 5 Internal reliability coefficients for ACC sample of 4 – 11 year-olds in care (n = 412)

		N. Items	Reliability coefficients (Cronbach's α)		
			Aggregate (n=412)	Boys (n=209)	Girls (n=203)
Clinical scales					
I.	Sexual Behavior ^a	9	.85	.85	.86
II.	Pseudomature	8	.82	.75	.86
III.	Non-Reciprocal	12	.86	.87	.84
IV.	Indiscriminate	8	.81	.77	.85
V.	Insecure	14	.85	.84	.86
VI.	Anxious – Distrustful	10	.78	.77	.78
VII.	Abnormal Pain Response	5	.70	.70	.69
VIII.	Food Maintenance	4	.80	.78	.82
IX.	Self-Injury	14	.81	.76	.84
X.	Suicide Discourse	7	.81	.77	.85
	Total Clinical Score ^b	102	.96	.95	.96
Self-Esteem scales					
I.	Negative Self-Image	9	.89	.90	.88
II.	Low Confidence	8	.83	.82	.85
	Total Low Self-Esteem ^c	18	.91	.91	.90

^a The Sexual behavior scale consists of 11 items (9 existing items plus two new items)

^b Sum of the ten scale scores plus nine 'other items'

^c Sum of the two scale scores plus one 'other item'

Appendix ACC scales with constituent items

CLINICAL SCALES

	Loading ^a	Item-rest ^b	Prevalence (%) ^c		Loading ¹	Item-rest ²	Prevalence (%) ³
I. Sexual Behavior				V. Insecure			
describes or imitates sexual behavior	.68	.70	12	extreme reaction to losing a friend or to being excluded by children	.52	.42	15
"flirts" with strangers	.49	.55	17	fears you will reject him/her	.46	.52	31
forces or pressures children into sexual acts	.80	.65	7	hides feelings	.42	.59	37
kisses with open mouth	.57	.52	8	is convinced that friends will reject him/her	.48	.59	20
sexual behavior not appropriate for age	.72	.71	14	lives in a fantasy world	.36	.42	25
shows sex parts to children (other than siblings)	.51	.46	9	refuses to talk	.41	.47	25
starts "rude" conversations, tells jokes about sex	.37	.45	13	says friends are against her	.43	.47	25
touches or puts mouth on other person's sex parts	.69	.51	4	seems insecure	.47	.63	44
tries to involve others in sexual behavior	.86	.75	9	startles easily	.44	.54	33
New items				too compliant (over-conforms)	.53	.45	17
sexual intercourse with another young person				tries too hard to please other children	.57	.50	35
sexual relations with an adult				tries too hard to please you	.67	.49	35
				withdrawn	.48	.53	18
				worries something bad will happen to you			
II. Pseudomature				VI. Anxious-Distrustful			
precocious (talks, behaves like an adult)	.68	.63	32	distressed by traumatic memories	.37	.52	28
prefers to be with adults, rather than children	.66	.63	32	distrusts adults	.46	.53	27
prefers to mix with older children	.59	.51	40	fearful of men in general	.63	.45	11
too "dramatic" (false emotions)	.36	.58	35	fearful or nervous at bed-time	.59	.53	13
too independent	.64	.51	27	fears she / he might be molested	.32	.33	5
too jealous	.35	.50	40	has nightmares	.33	.35	34
treats you as though you were the child, and he/she was the parent	.58	.54	26	has panic attacks	.60	.42	8
turns friends against each other	.40	.42	14	is fearful of being harmed	.55	.53	17
				wants to be treated like a baby, or a toddler	.38	.36	27
				wary or vigilant	.45	.50	19
III. Non-Reciprocal				VII. Abnormal Pain Response			
avoids eye contact	.56	.49	38	does not cry	.52	.46	24
does not share with friends	.53	.50	40	does not show pain if physically hurt	.76	.67	15
does not show affection	.70	.49	23	laughs when injured or hurt	.56	.40	16
lacks guilt or empathy	.64	.64	39	risks physical safety, fearless	.36	.37	21
manipulates or uses friends	.52	.56	29	won't say when physically hurt	.58	.45	14
play includes violent or frightening themes	.45	.54	27				
possessive, can't share friends	.41	.52	34	VIII. Food Maintenance			
resists being comforted when hurt	.39	.36	13	eats too much	.65	.62	25
secretive	.42	.59	37	gorges food	.67	.65	23
suspicious	.37	.56	22	hides or stores food	.68	.57	14
uncaring (shows little concern for others)	.74	.65	31	steals food	.69	.60	18
won't communicate with other children	.40	.45	15				
IV. Indiscriminate							
attention-seeking behavior	.52	.60	74				
changes friends quickly	.38	.51	36				
clingy	.38	.41	52				
craves affection	.53	.62	64				
easily influenced by other children	.48	.45	72				
hugs men (other than relatives or male carer)	.49	.46	20				
relates to strangers "as if they were family"	.63	.64	47				
too friendly with strangers	.60	.54	68				

^a Factor loading

^b Item-rest correlation (correlation of the item score and the sum of all other items in the scale)

^c Item prevalence (percentage of sample with item score of 1 or 2, n = 412)

CLINICAL SCALES (continued)

	Loading ^a	Item-rest ^b	Prevalence (%) ^c
IX. Self-Injury			
asks to be physically punished	.44	.42	4
bites him/herself	.49	.52	9
causes him/herself to vomit	.42	.31	4
causes injury to him/herself	.56	.55	10
cuts or pulls out own hair	.43	.41	8
cuts or rips own clothes	.46	.45	10
eats from garbage	.63	.49	7
eats things that are not food	.62	.42	8
hits head, head-banging	.55	.51	10
intentionally harms her/himself with knives/implements	.64	.38	2
intentionally swallows dangerous substance to harm self	.77	.40	1
rocks back and forth	.42	.39	8
throws her/himself against walls, onto floors, etc	.36	.46	13
unhealthy drinking (e.g. from discarded drink bottle, from toilet bowl)	.59	.51	5
X. Suicide Discourse			
attempts suicide	.34	.27	1
describes how he/she would kill themselves	.52	.51	2
requests to be harmed	.55	.48	2
says life is not worth living	.69	.50	5
talks about suicide	.84	.74	4
threatens to injure her/himself	.65	.62	3
threatens to kill him/herself	.77	.72	3
Other Items			
<i>Inattentive items</i>			
can't concentrate, short attention span			66
gets hurt a lot, accident prone			32
picks at sores, or injuries			38
very forgetful			49
<i>Dissociative items</i>			
has an imaginary friend			9
has blackouts or periods of amnesia			2
thinks he/she is someone, or something else			8
<i>Sexual items</i>			
masturbates at home in view of others			9
masturbates at school, or in public			3

LOW SELF-ESTEEM SCALES

	Factor 1 ^d	Factor 2 ^e	Item-rest ^b	Prevalence (%) ^c
I. Negative Self-Image				
believes he/she is no good at anything	.73	.09	.70	29
complains of not being likeable	.64	.04	.54	27
dislikes her/himself	.81	-.06	.71	19
fears he/she might do something bad	.60	.06	.54	14
feels ashamed	.63	-.05	.53	11
feels worthless or inferior	.85	.02	.80	20
has a low opinion of her/himself	.74	.17	.75	27
says she/he is "bad", or "no good"	.74	-.02	.65	15
thinks other children are better than him/her	.66	.07	.61	24
II. Low Confidence				
adjusts slowly to changes	-.08	.58	.42	46
does not speak up for her/himself	-.19	.68	.44	31
easily discouraged at home	.19	.60	.60	30
easily discouraged at school	.19	.58	.57	34
finds it hard to make decisions	.06	.73	.66	51
gives up too easily	.04	.74	.65	56
lacks confidence	.15	.69	.64	47
won't attempt new activities	-.03	.68	.54	29
Other Item				
low self-esteem	.53	.41	n.a.	38

^a Factor loading^b Item-rest correlation (correlation of the item score and the sum of all other items in the scale)^c Item prevalence (percentage of sample with item score of 1 or 2, n = 412)^d Loading on Factor 1 on 2-factor model of low self-esteem^e Loading on Factor 2 on 2-factor model of low self-esteem