



The Abusive Behaviour by Children- Indices (ABC-I): a Measure to Discriminate between Normative and Abusive Child Behaviour

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Published online: 1 June 2019

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Abstract

Child-to-parent abuse (CPA) research struggles to differentiate between disrespectful and abusive behaviour, leading some to conclude that 90% of children abuse their parents and rendering the concept essentially meaningless. The Abusive Behaviour by Children-Indices (ABC-I) was developed with the aim of differentiating abusive and non-abusive youth using a novel scoring procedure created from parents' norms about abuse. The ABC-I was developed with parents of young people aged 14–25 years ($N = 201$) using index-development procedures. The structure of the ABC-I was validated with young people aged 14 to 25 ($N = 587$) using partial least squares-structural equation modelling. Using the parents' sample, 40 items derived from the literature were reduced to 10 behavioural descriptors. Parents who identified their children as abusive were 89% more likely to have higher ABC-I scores than non-abused parents. The structure of the ABC-I was further reduced to nine items in the youth sample. The ABC-I identified a 12-month CPA incidence rate of 16%. The ABC-I is the first CPA measure to provide an evidence-based threshold for abuse that incorporates both frequency and severity of abuse to improve upon the identification of abuse involving psychological aggression or coercion.

Keywords Child-to-parent abuse · Child-to-parent violence · Aggression · Index development · Family violence

Child-to-parent abuse (CPA) was first mentioned in academic literature in 1957, as researchers unexpectedly observed kindergarten-aged children being physically aggressive towards their parents (Sears et al. 1957). The almost incidental nature of this early study was repeated in subsequent CPA research during the twentieth century, as clinicians (e.g., Gallagher 2004; Harbin and Madden 1979) and researchers (e.g., Brezina 1999; Kolko et al. 1996) described unexpected findings that children often acted aggressively towards their parents, but without intending to measure CPA or situating their findings within the context of existing research. This has produced a disjointed field of exploratory research that developed without purposeful hypothesis testing or theoretical

guidance, or even a consistent way of defining or measuring CPA. As a consequence, it is difficult to generalise between studies or conduct experimental research in which the presence of CPA can be clearly ascertained (Simmons et al. 2019). In this paper, we critically review existing approaches to measuring the presence and nature of CPA and describe the development of the Abusive Behaviour by Children-Indices (ABC-I), a tool designed to categorise children as abusive if the frequency or severity of aggressive behaviour towards their parents exceeds what is considered to be socially normative.

Measurement of CPA to Date

Initial CPA measurement involved direct observation of aggression towards parents or descriptions of abusive youth by clinicians who encountered this behaviour in practice (e.g., Charles 1986; Harbin and Madden 1979). As CPA gained recognition as a form of family violence, the Conflict Tactics Scale (CTS; Straus 1979) became popular in CPA research (e.g., Browne and Hamilton 1998; Ibabe and Bentler 2016). While the CTS was originally developed and used as a measure for all forms of family violence (Straus 1979), more

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recently the CTS and its successor (the CTS-2; Straus et al. 1996) have been strongly associated with intimate partner violence (IPV) research, with the CTS-2 using IPV-specific items. As such, CPA research has generally used six questions from the original CTS to assess verbal and physical aggression towards parents (e.g., Browne and Hamilton 1998). However, similar to criticisms that led to the development of the CTS-2, the CTS applied to CPA neglects some of the phenomena that have been observed in descriptive studies of CPA (e.g., coercion; financial abuse) and focuses on frequency of behaviour, rather than severity, thus providing limited insight into how harmful different behaviours used with similar frequency may be (Rubio-Garay et al. 2017).

As the CPA field expanded, CPA-specific instruments were developed to address a wider range of potentially abusive behaviour (Calvete et al. 2013; Contreras et al. 2019; Edenborough et al. 2011; Ghanizadeh and Jafari 2010). The first of these tools was the Abused Parent Questionnaire (APQ; Ghanizadeh and Jafari 2010), a 27-item measure that assessed the frequency of a child's aggressive behaviour. It was developed from parents' descriptions of aggressive and abusive behaviour by children in the National Clearinghouse on Family Violence report (DeKeseredy 1993). The APQ subsequently demonstrated good internal reliability and concurrent validity in a sample of children aged 6 to 14 years recruited in a psychiatric setting in Iran (Fawzi et al. 2013). Shortly thereafter, the 9-item Child-to-Mother Violence Scale (CMVS; Edenborough et al. 2011) was developed in Australia for use with mothers of children aged 10 to 24 years. The items were derived from existing measures, literature, and feedback from children, parents, and experts, and demonstrated sufficient test-retest validity, internal reliability, and split-half reliability in the development sample. The CMVS has not been used in published research since the development study. The Child-to-Parent Violence Questionnaire (CPV-Q; Contreras et al. 2019) is a Spanish questionnaire. The validation paper is not clear where the 28 original items were drawn from. Using exploratory and confirmatory factor analysis the CPV-Q was reduced to 14 items which can be completed for both mothers and fathers. The CPV-Q also includes scales to assess reasons for abuse. However, it does not specify a cut-off score for abuse.

Recently, the Child-Parent Aggression Questionnaire (CPAQ; Calvete et al. 2013), and its predecessor, the Intra-Family Violence Scale (Ibabe et al. 2013), have become the most commonly used CPA-specific tools in research (e.g., Calvete et al. 2015a, 2015b; Izaguirre and Calvete 2017; Rico et al. 2017). The development paper did not describe the item selection process, as such it is presumed that these behaviours were chosen based upon their face validity. The structure and internal reliability for this Spanish tool was tested in the development study with youth aged 13–18 years, although it has also been used in older samples (e.g., Rico

et al. 2017). The CPAQ scores problematic behaviour based upon frequency. A cut-off for *Severe Aggression* is provided (i.e., psychological coercion that has occurred more than six times or physical aggression that has occurred at least three times; Calvete et al. 2013). However, this cut-off cannot account for combination of different behaviours resulting in an abusive pattern of behaviour. Moreover, it is unclear how this threshold was derived or whether it is effective in differentiating normative, if disrespectful, from abusive behaviour.

Critique of Measurement Approaches

Differentiating between Abuse and Aggression A problematic aspect of the three existing measures of CPA is the use of arbitrary, author-imposed, thresholds for abuse that have not been tested against any external measure. The presence of a single behaviour has often been used to determine the prevalence of abuse when using the APQ (Fawzi et al. 2013), CPAQ (e.g., Calvete et al. 2015a, b; Izaguirre and Calvete 2017), and the CMVS (Edenborough 2007). While this may be an appropriate way to identify the presence of physical CPA, other research has shown that it is the frequency with which non-physical aggression is repeated that is the most important factor in determining whether it is considered abusive (Follingstad and Dehart 2000).

Lack of consideration for the overall pattern of behaviour and the interaction between the severity and frequency of non-physical aggression in existing tools has resulted in marked differences in CPA research using qualitative versus quantitative designs. Qualitative research highlights the gravity of psychological abuse, noting parents' reports that psychological abuse is more difficult to cope with than physical abuse (Eckstein 2004). Quantitative research conflates patterns of psychological abuse with single incidents of, or infrequent disrespectful behaviour, inflating prevalence estimates of overall CPA (e.g., 91%; Calvete et al. 2015a, b) and hindering the investigation of characteristics associated specifically with abuse. For example, in some studies participants would be labelled as abusive for yelling at their parents once (Ghanizadeh and Jafari 2010). Inconsistency in the results of research using different designs suggests fundamental problems in how CPA has been ascertained, a particular problem for epidemiological studies attempting to describe the phenomenon. If the nature of CPA, the characteristics of perpetrators, and its impact on targets are to be understood, the first step must be accurate measurement that is not onerous to complete, which captures the full scope of the phenomenon, and which allows the user to differentiate CPA from inappropriate but non-abusive behaviour.

Critique of Theory Guiding CPA Measurement In addition to short-comings in how CPA has been operationalised, there

appear to be weaknesses in the theory underpinning CPA measurement more generally. In psychological research, Classical Test Theory (CTT) is the principal theory guiding measure development (Allen and Yen 1979; Nunnally 1978). CTT assumes that items from the same scale are *caused by* the same underlying variable. For example, as traits such as intelligence cannot be directly measured, cognitive assessments use items that *reflect* participants' underlying intelligence. Any changes in the items (e.g., answers to algebra questions) *reflect* or are *caused by* changes in the underlying variable (e.g., mathematic intelligence). In contrast, children are labelled 'abusive' as a *consequence* of their pattern of behaviour, rather having an underlying 'abuse' trait that causes this behaviour. While some abusive behaviours may cluster together (e.g., financial, physical, emotional control), a change in one abusive behaviour does not necessarily mean a change in all types of abusive behaviour. In this sense, abuse is a *formative* construct that is composed of observable phenomena and does not exist in their absence, rather than a *reflective* construct that underpins observable phenomena and exists without their presence (Bollen and Lennox 1991).

While reflective constructs are measured using scales, formative constructs are measured using indices. Scale development aims to verify the assumption that a single reflective variable affects all items on the scale by demonstrating internal consistency (i.e., items measure the same underlying construct), convergent validity (i.e., scale is related to other measures of the same construct), and discriminant validity (i.e., scale is not related to measures of different constructs; DeVellis 2012). Index development does not share this assumption. In fact, the deletion of items because of poor internal consistency may reduce the validity of the index if a poorly correlating item is omitted that captures a unique characteristic of the formative construct (DeVellis 2012). Rather than using measures of reliability and validity to develop an index, index development involves: (1) specifying the breadth of the formative construct; (2) a census of items that form the construct; (3) investigating item multicollinearity; and (4) examining items' external validity (Diamantopoulos and Winklhofer 2001). While the first two stages are theoretical, the latter two provide empirical evidence that the items are not redundant within the index and measure the full scope and nature of the formative construct.

Although abuse has traditionally been measured using scales developed based on CTT, there is some evidence to support the idea that indices would be more appropriate for the measurement of abuse. Subscales of the CTS and CTS-2 are weakly to moderately correlated with each other, suggesting that they may not reflect a single latent variable (Newton et al. 2001; Pan et al. 1994), and there is a notable lack of research regarding the overall internal consistency for the CTS and CTS-2 (although individual subscales evidence good internal consistency; Straus 1979; Straus et al. 1996; Straus

2004). Similarly, internal consistency for the CPAQ is also typically reported according to subscale and varies in strength (i.e., α range: .61–.88; Calvete et al. 2015a, b; Izaguirre and Calvete 2017), with no evidence that the subscales all reflect a single underlying construct. We propose that, rather than attempting to refine a measure to the most parsimonious set of behavioural descriptors with high inter-correlations, a more appropriate way to measure the full breadth and range of CPA is to develop an instrument measuring a formative construct according to the principles of index development.

The Current Research

This paper describes the development of the Abusive Behaviour by Children Indices (ABC-I), which measures the frequency and severity of a range of potentially abusive behaviours children may use towards parents. The ABC-I aims to provide a culturally-relevant measure of CPA that can be completed by either parents or children (aged from pre-teen to adulthood). The ABC-I's development is informed by the content of the Beliefs about Child to Parent Abuse Questionnaire (BACPAQ; Simmons et al. 2019), a measure of social norms regarding what constitutes CPA.

Study 1: Developing the ABC-I with Data from Parents

Study 1 first aimed to develop the Abusive Behaviour by Children-Indices (ABC-I) to differentiate normative behaviour towards parents from CPA, and then aimed to examine the validity of outcomes derived using the indices against an external criterion of whether CPA was present.

Method

Parents of adolescents and young adults aged 14–25 years ($N = 201$; female = 173; $M_{age} = 45.35$, $SD = 6.27$ range: 32–64) were recruited through a university research experience program, advertisements on social media, and a nationally recognised youth mental health website. Within Australia, universities accept a wide variety of students, including those who are returning to study after work, making it possible to recruit parents of youth as participants. The university participants were compensated with 0.5% course credit for an introductory psychology class. Other participants did not receive compensation. Most participants identified Australian as their primary cultural background (70.5%; $n = 141$), with one participant identifying as Aboriginal (0.5%). The remaining participants identified as European (19.5%; $n = 39$), Asian (4.0%; $n = 8$), African (1.5%; $n = 3$), an American culture or

ethnic group (2.0%; $n = 4$) or as New Zealanders (1.5%; $n = 3$).

Participants read a plain language statement highlighting that the purpose of the study was to differentiate between “normal versus more abusive behaviour”. After reading the plain language statement, participants clicked “I consent” and identified whether their child (aged 14 to 25) had engaged in any of 40 behaviours towards them over the past 12 months. Participants who had multiple children were asked to complete the questionnaire while keeping in mind their ‘most difficult child (even if they were rarely difficult)’. Participants reported having between 1 and 9 children (Median = 2), with most parents ($n = 174$; 86.5%) reporting multiple children in their family. Approximately half of parents reported that their most difficult child was female ($n = 105$; 52%). This procedure was approved by Swinburne University Human Research Ethics Committee (SUHREC) on 13 November 2014.

Materials

Abusive Behaviour by Children-Indices (ABC-I) The ABC-I consisted of 40 behaviour descriptors rated by frequency on a 7-point scale (*Never–Once–A few times–Monthly–Weekly–Daily–Several times a day*). These items were derived from both qualitative and quantitative CPA literature as well as measures of intimate partner abuse, to ensure that a broad range of behaviours were considered (see Simmons et al. 2019, for more information on item selection).

The development of the ABC-I was informed by the Beliefs About Child-to-Parent Abuse Questionnaire (BACPAQ; Simmons et al. 2019), which investigates social norms about CPA by asking how often various behaviours must occur to be abusive. Simmons et al. (2019) found that Australian parents reached consensus that 36 of the behaviours had the potential to be abusive in the child-parent relationship. Two ABC-I items, *Threatened to burn parents’ possession* and *Burned parent’s possessions*, could not be investigated in this study because no participants endorsed them. For this study, the scale was reduced from seven to six points because the difference between *Daily* and *Several times a day* was thought to lack specificity.

The ABC-I scoring procedure differs by item, depending on parents’ perceptions of how often the behaviour described in the item would have to occur to be abusive. For each ABC-I item, a score of 16 is given to the frequency at which the behaviour is thought to become abusive (i.e. the threshold of abuse as set by parents responding to the BACPAQ). For example, in the Australian sample of parents used to set scoring for the ABC-I in this study, swearing at a parent had to occur daily over 12 months, while strangling a parent only had to occur once to be considered abusive and receive a score of 16 (Simmons et al. 2019). If a behaviour was

reported to occur more or less frequently than the item’s threshold for abuse, the score increased or decreased by a factor of 2, respectively. The score of 16 was selected as the threshold for abuse to improve usability, as it was the lowest number that would result in a whole number if divided by a factor of 2 repeatedly. Possible scores for swearing at a parent ranged from 1 (occurred once) to 16 (occurred daily), while scores for strangling a parent ranged from 16 (occurred once) to 256 (occurred daily).

Procedure

Index Development Index development followed the procedure outlined by Diamantopoulos and Winklhofer (2001) and described above. While the first two steps in this procedure are theoretical, not empirical, discussing them is necessary to demonstrate valid index development.

Specification of content. Items on the BACPAQ were selected to capture the full range of CPA described in the literature, including property damage and physical, verbal, emotional, psychological, or financial aggression (Cottrell 2001; Holt 2013; Howard and Rottem 2008). See Simmons et al. (2019) for a detailed discussion of item selection.

Specification of items. Using the BACPAQ, Simmons et al. (2019) provided evidence that 36 of the 40 the behaviours described had the potential to be abusive, according to Australian parents. These 36 items are listed in Table 1.

Examination of collinearity. Spearman’s correlations and Variance Inflation Factors (VIF) were calculated to assess collinearity of the 34 ABC-I items measured in this study (Diamantopoulos et al. 2008; Kleinbaum et al. 2013). In index development, there are no assumptions about the relationships between items (Bollen and Lennox 1991); rather correlations need only be consistent with theory (Cadogan et al. 2008). For this study, items with null or weak inter-correlations were retained as they were seen to capture a unique characteristic of CPA. Items were removed or collapsed if negative correlations were found, as there is no theoretical justification for inverse relationships between behaviours, or if items were highly correlated (i.e., $\rho < .80$ or a VIF > 10 ; Kleinbaum et al. 2013). If items with differing thresholds for abuse were collapsed, the threshold of the item with the greater severity was applied (e.g., item [7]’s threshold for abuse was *Weekly* and item [8]’s was *Monthly*. *Monthly* would be the resulting threshold after collapsing the two items because items that have to occur less often to meet the threshold for abuse are considered to be more severe).

Criterion validity. Spearman’s correlations were used to assess the strength of the relationship of each item on the ABC-I with participants’ opinion of whether their child’s behaviour towards them was abusive (yes/no). Any items on the ABC-I that were not positively correlated parents’ perception that abuse was present were removed.

Table 1 Items Used to Develop the Abusive Behaviour by Children-Index with their Thresholds

	Item	Threshold
1	Shouted	Daily
2	Swore at parent	Daily
3	Swore at parent in front others	Daily
4	Insulted or humiliated a parent	Daily
5	Purposefully made a parent feel guilty so that they would do something for the child	Daily
6	Slammed, kicked objects in the house	Daily
7	Threatened to break, smash objects in the house	Weekly
8	Broke, smashed, objects in the house	Monthly
9	Purposefully collected debt that parent had to cover	Monthly
10	Threatened to or tried to turn family and friends against parents	Few times
11	Attempted to intimidate parents	Few times
12	Threatened to hurt self or others if parent did not do what he/she wanted	Few times
13	Stole parent's money or possessions	Few times
14	Used exploitation or threats to get parent to give him/her money	Once
15	Made parent do something humiliating	Once
16	Kept parent from doing something that they wanted	Once
17	Forcibly confined parent	Once
18	Kept parent from medical attention	Once
19	Threatened parent with an object	Once
20	Threw something at parent – No Injury	Once
21	Grabbed, pushed parent - No Injury	Once
22	Hit, slapped, kicked, or punched parent - No injury	Once
23	Kicked, or punched parent - No injury	Once
24	Threw something at parent – Minor Injury	Once
25	Grabbed, pushed parent - Minor Injury	Once
26	Hit, slapped, kicked, or punched parent - Minor injury	Once
27	Kicked, or punched parent - Minor injury	Once
28	Threw something at parent – Major Injury	Once
29	Grabbed, pushed parent - Major Injury	Once
30	Hit, slapped, kicked, or punched parent - Major injury	Once
31	Kicked, or punched parent - Major injury	Once
32	Burned or scalded parent	Once
33	Strangled parent	Once
34	Used weapon against parent	Once
35	Threatened to burn parents' possessions	Once
36	Burned parents' possessions	Once

Index structure. Principle Components Analysis (PCA) was computed using promax rotation to explore the structure of the ABC-I, as there is no prior research on which to base confirmatory analyses. While traditional factor analysis examines the shared variance between items, PCA calculates the overall variance amongst a group of items, which better reflects the intent of index development, rather than scale development (Bryant and Yarnold 1995).

Evaluation of Indices Following the development of the ABC-I, a Mann Whitney *U* test was conducted to determine whether scores on the ABC-I differed significantly for parents who

reported that their child's behaviour was abusive compared to those who did not.

Receiver Operating Characteristic (ROC) analysis was used to calculate the Area under the Curve (AUC) to determine how effectively the novel scoring method discriminated between parents who reported their child's behaviour to be abusive and those who did not. In this sample, 38% ($n = 76$) of participants described their child as being abusive towards them. The ROC curve plots the sensitivity and 1-specificity values for each possible score on the ABC-I. The overall AUC value represents the probability that a randomly selected participant who described their child as abusive would score

higher on the ABC-I than a participant who described their child as not abusive (AUC = 0.50 indicates that score distributions are no better than chance, while an AUC = 1.0 indicates that the self-identified abused group score higher 100% of the time). The sensitivity and 1-specificity of each point on the AUC was examined to determine the optimum ABC-I score for differentiating abusive from normative behaviour.

Results

Examination of Collinearity

All correlations between items were significant, ranging from $\rho = .22$ – 1.0 . Three items ([14], [5], [9]) were removed due to multicollinearity with two ($\rho = .85$ – $.86$), four ($\rho = .79$ – $.85$), and six ($.79$ – $.86$) variables, respectively. All physical aggression items ([20] to [35]) were combined into a single variable due to multicollinearity ($\rho = .70$ – 1.00). Two pairs of items ([17]–[18]; [7]–[8]) were combined due to correlations ranging from .80 to .97. Items [3] and [10] were removed due to multicollinearity ($\rho = .80$ – $.84$) with items [2] and [11], respectively. After collapsing the multicollinear items, all VIFs were below the cut-off of 10 (range = 1.53–5.08), confirming absence of multicollinearity in the remaining 13 items.

Criterion Validity

All items were significantly and positively correlated ($r = .22$ – $.53$) with parents' judgements that their child's behaviour was abusive, evidencing criterion validity.

Examination of Structure

A PCA was computed using the remaining 13 items. The KMO test showed that the model was fair (.73) and the determinant of the matrix was acceptable at .000064. Items [6],

[15], and [16] were removed due to cross-loadings greater than .35. The remaining 10 items (see Table 2) demonstrated fair model fit (KMO = .78; 95% CI = .73–.86) and had an acceptable determinant of the matrix (.0055). Parallel Analysis recommended three components based upon the mean, which explained 72% of the variance. The RMSR = 0.077 (95% CI: .05–.10) was acceptable (Harman 1962). The three components were related to verbal aggression (3 items), coercive behaviour (4 items), and physical aggression (3 items). Although, *Broke, smashed objects or threatened to do so* was cross-loaded on coercive behaviour and physical aggression, it was retained on the coercive behaviour component because, despite both loadings being greater than .35, the difference in component loadings was .20 (Hair Jr et al. 2016). All components were moderately correlated with each other (physical - coercive (.43); physical - verbal (.40); coercive - verbal (.42)).

The potential range for scores on the ABC-I is 0 to 1264. In the current sample, the median ABC-I score was 8 ($M = 33.66$, $SD = 63.22$, range: 0–584). It seems unlikely that respondents would obtain scores above 700, as this would require daily acts of physical aggression towards a parent. That said, youth who did score in this range would be engaging in extremely severe CPA and the ABC-I would be effective in detecting and differentiating this from less severe abuse. In this sample, ABC-I scores were significantly greater for parents who reported that their child's behaviour was abusive (Median = 79) compared to those who did not (Median = 2; $U = 1038$, $p < .001$).

The ROC analysis showed that scores on the ABC-I provided excellent discrimination between parents who perceived their child's behaviour to be abusive and those who did not (AUC = .89 (95% CI: .84–.94), $SE = .03$, $p < .001$). Examination of the sensitivity and specificity associated with each possible score showed that a score of 16 provided the best classification of cases, classifying 82% of self-identified abuse cases as abusive (sensitivity = .82), while classifying

Table 2 Factor Loadings of ABC-I

Item	Verbal aggression	Coercive behaviour	Physical aggression
Shouted at a parent	.81		
Swore at a parent	.84		
Insulted or humiliated a parent	.85		
Attempted to intimidate a parent		.85	
Stole money or possessions from parents		.78	
Threatened to hurt self or others if parent did not do what the child wanted		.78	
Broke, smashed objects in the house, or threatened to do so		.56	.36
Acted physically aggressive (e.g., hit, slap, kick, push, punch, grab, burn, strangle) towards parent			.76
Kept parent from seeking help or medical care			.86
Threatened parent with an object			.82

83% of self-identified ‘not abuse’ cases as non-abusive (specificity = .83).

Discussion of Study 1

The ABC-I items were derived from CPA and IPV literature. Ten items clustered into three components, which represented physical aggression, verbal aggression and coercive behaviour. Notably, the coercive component included financial and emotional abuse items, ensuring that all aspects of the theoretical definition of CPA were addressed in the measure. The components were moderately correlated with each other, as might be expected given the potentially different determinants of different patterns of CPA (Simmons et al. 2018). Due to different validation procedures for scales and indices, we did not calculate internal consistency.

The ABC-I demonstrated an excellent ability to discriminate between parents who described their children as abusive and those who did not, with an 89% probability that a randomly selected parent from the former group would have a higher score than a randomly selected parent from the latter group. In the current sample, a total score of 16 demonstrated optimal sensitivity and specificity in differentiating between parents experiencing abusive and non-abusive behaviour. Coincidentally, using the chosen scoring metric a score of 16 is also given to the threshold at which a behaviour is considered to be abusive according to local social norms (Simmons et al. 2018). Therefore, whether participants receive a score of 16 because their child met the threshold for a single behaviour, or because of their child’s overall pattern of behaviour, they will be categorised as targets of abuse using the ABC-I.

Study 2: Validation of the ABC-I with Data from Youth

The aim of Study 2 was to confirm the structure of the ABC-I within an Australian youth population aged 14–25 years old and investigate convergent validity with the CPAQ.

Method

Sample

Participants ($n = 587$) aged 14 to 25 years ($M = 20.44$; $SD = 2.45$) were recruited online. Most participants ($n = 434$; 74%) were enrolled in an undergraduate introductory psychology course. These participants were compensated with 0.5% increase to their overall course grade. The remaining participants ($n = 153$; 26%) were recruited from

social media or a nationally recognised mental health website and were not compensated for their participation. Most participants were female ($n = 456$; 77.8%) and Australian ($n = 458$; 78.0%), with three (0.5%) identifying as Australian Aboriginal. The remaining participants identified as being European (8.5%; $n = 50$), Asian (7.2%; $n = 8$), African (2.6%; $n = 15$), Kiwi or Maori (1.7%; $n = 10$), from the Americas (1.2%; $n = 10$) or Russian (0.3%; $n = 2$).

After reading a plain language statement, participants provided consent electronically. Participants were asked to describe who raised them as a child. Most reported that they were raised by both parents (67%; $n = 398$), followed by their mother (30%; $n = 181$), their father (2%; $n = 10$), or raised by others (e.g., grandparents; 1%; $n = 6$). There were no reported same-sex parental relationships. Participants completed an ABC-I for each of the caregivers who raised them (if applicable). In total, 580 participants completed an ABC-I for their mother (or female caregiver) and 466 participants completed an ABC-I for their father (or male caregiver), with 454 participants completing ABC-Is for both parents.

Materials

Abusive Behaviour by Children-Indices (ABC-I) Participants completed a 40-item questionnaire which asked how often they used each behaviour towards a parent within the past 12-months on a 7-point ordinal scale from *Never* to *Several times a daily*. Based on the results of Study 1, their responses were collapsed into the 10-item ABC-I with a 6-point rating scale (i.e., *Never* to *Daily*) to confirm the structure of the ABC-I. Collapsed items were scored based upon the highest score within the collapsed group of items.

Child to Parent Aggression Questionnaire (CPAQ) The CPAQ (Calvete et al. 2013) consists of 10 items administered separately for each parent measuring physical (3 items) and psychological (7 items) CPA within the past year of living together. The psychological abuse questions contain items about verbal aggression and financially abusive behaviours. While there has been variation in the internal consistency of the CPAQ subscales in past research (i.e., α range: .61–.88; Calvete et al. 2015a, b; Izaguirre and Calvete 2017), internal consistency in the present study was acceptable for both the physical ($\alpha = .77$) and psychological scales ($\alpha = .75$).

On the advice of an author of the CPAQ, the present study used a version of the CPAQ scored on a 5-point scale (1 = *never* to 5 = *very often*). A cut-off for *Technical Abuse* was used to highlight participants who endorsed using any behaviour *sometimes* (i.e., 3+; I. Ibabe, personal communication, September 26, 2017).

Procedure

A Partial Least Squares-Structural Equation Model (PLS-SEM) was used to confirm the 3-component structure of the ABC-I reported in Study 1. PLS-SEM is a non-parametric alternative to Covariance-Based - Structural Equation Modelling (CB-SEM) that does not assume that data has to be normally distributed (Hair et al., 2107). PLS-SEM is also better able to model formative constructs, such as CPA, and validate indices, whereas CB-SEM is more appropriate for scale development (Hair Jr et al. 2016). Index development differs from scale development in that the greater the number of items, the more likely it is that an item's weight in a structural model will be non-significant (Hair Jr et al. 2016). To address this issue, items were grouped according to their sub-indices, creating a hierarchical formative measurement model (Becker et al. 2013; Hair Jr et al. 2016), in which items pointed towards both the presence of sub-index constructs and the overall construct.

Collinearity was assessed by calculating VIF values. The outer-weights of the model were examined to determine each item's relative contribution to the overall construct of CPA. Bootstrapping was used to test whether the outer-weights were significantly different from zero. As outer-weights are relative, a non-significant result does not automatically justify removal of the item. Outer-loadings must also be considered to evaluate the item's absolute contribution to the construct (Hair Jr et al. 2016). Items with non-significant outer-weights were retained if they had either: (1) high (i.e., $>.50$) outer-loadings or (2) moderate (i.e., $>.20$) outer-loadings but theoretical importance (Hair Jr et al. 2016). Gender comparisons on the ABC-I were conducted using Chi-Square tests with Odds Ratio as measure of effect size.

Convergent validity was assessed by correlating the ABC-I scores of 135 participants who were cohabiting with a parent at the time of participation and who had results on the CPAQ. Additionally, Chi-Square goodness of fit test with Cramer's V as a measure of effect size was used to determine whether the threshold for *Technical Abuse* categorised the same proportion of participants as abusive as the ABC-I's threshold for abuse.

Results

The VIF values (1.02–2.43) were well below the threshold of 10, indicating that multicollinearity was not an issue (Kleinbaum et al. 2013). Examination of the subindices model showed that *Swore at parent* had an insignificant outer weight (.02) and outer loading (.01). As such, it was collapsed into,

Swore or shouted at parent. The model was rerun and once again the VIF values (1.45–1.88) suggested that multicollinearity was not a problem. This time, all outer weights pointing to the subindices were significant (.15–.93).

Three items had non-significant outer weights in the overall index, *Swore or shouted at parent* (.05), *Stole money or possessions from parents* (.07), and *Threatened parent with an object* (.09). However, all items had moderate outer loadings of .37, .33, and .40, respectively. These items were retained as they represent aspects of CPA that would be not assessed without them (i.e., verbal, financial, and threatened physical abuse).

The total effects of the subindices on the index were .30 (verbal aggression), .41 (physical aggression), and .50 (coercive behaviour). There were strong correlations between the ABC-I and its subindices (.79 - physical, .83 - verbal, .86 - coercive), as well as moderate correlations between the subindices themselves (coercive behaviour -physical aggression (.43); physical aggression - verbal aggression (.54); coercive behaviour - verbal aggression (.61)).

The final version of the ABC-I contained nine questions (see Fig. 1). While the ABC-I has a total possible score of 1216, scores in this sample ranged for 0 to 608 ($M=7.61$; $SD=38.80$; Median = 0) for behaviour towards fathers and 0 to 352 ($M=6.69$; $SD=25.92$; Median = 1) for behaviours towards mothers. Overall, 16% ($n=98$) participants were classified as abusive towards at least one of their parents (i.e., score ≥ 16 per Study 1), with 15% ($n=84$) of participants categorised as abusive towards their mother and 10% ($n=46$) as abusive towards their father. The most common targets of abuse were mothers in two-parent households (35%; $n=35$) or both parents (35%; $n=34$), followed by single mothers (17%; $n=16$), then fathers in two-parent households (13%; $n=13$). No participants abused single fathers.

As shown in Table 3, males were significantly more likely than females to report abusing either parent ($\chi(1, N=585)=7.01, p<.01, OR=1.90, 95\% CI=1.18-3.08$) or their fathers ($\chi(1, N=465)=6.49, p=.01, OR=2.27, 95\% CI=1.19-4.32$). Mother abuse did not significantly differ between males and females ($\chi(1, N=576)=2.37, p=.12$), nor did the frequency of the various types of abuse. However, males were more likely than females to report coercive behaviour towards their fathers ($\chi(1, N=465)=10.447, p=.001, OR=2.44; 95\% CI=1.41-4.25$) and mothers ($\chi(1, N=576)=7.13, p<.01, OR=1.89; 95\% CI=1.78-3.03$).

Finally, convergent validity was assessed by comparing the ABC-I and the CPAQ. In the reduced sample ($n=135$), 42% met the threshold for abuse on the CPAQ for mothers ($M=6.96$; $SD=4.35$, range: 0–21) and 36% met the threshold for fathers ($M=6.05$; $SD=4.42$; 0–17). There were no gender differences in CPAQ scores for aggression against fathers ($t(39.86)=-.34, p=.73, M_{diff}=-.36$) or mothers ($t(133)=.90$,

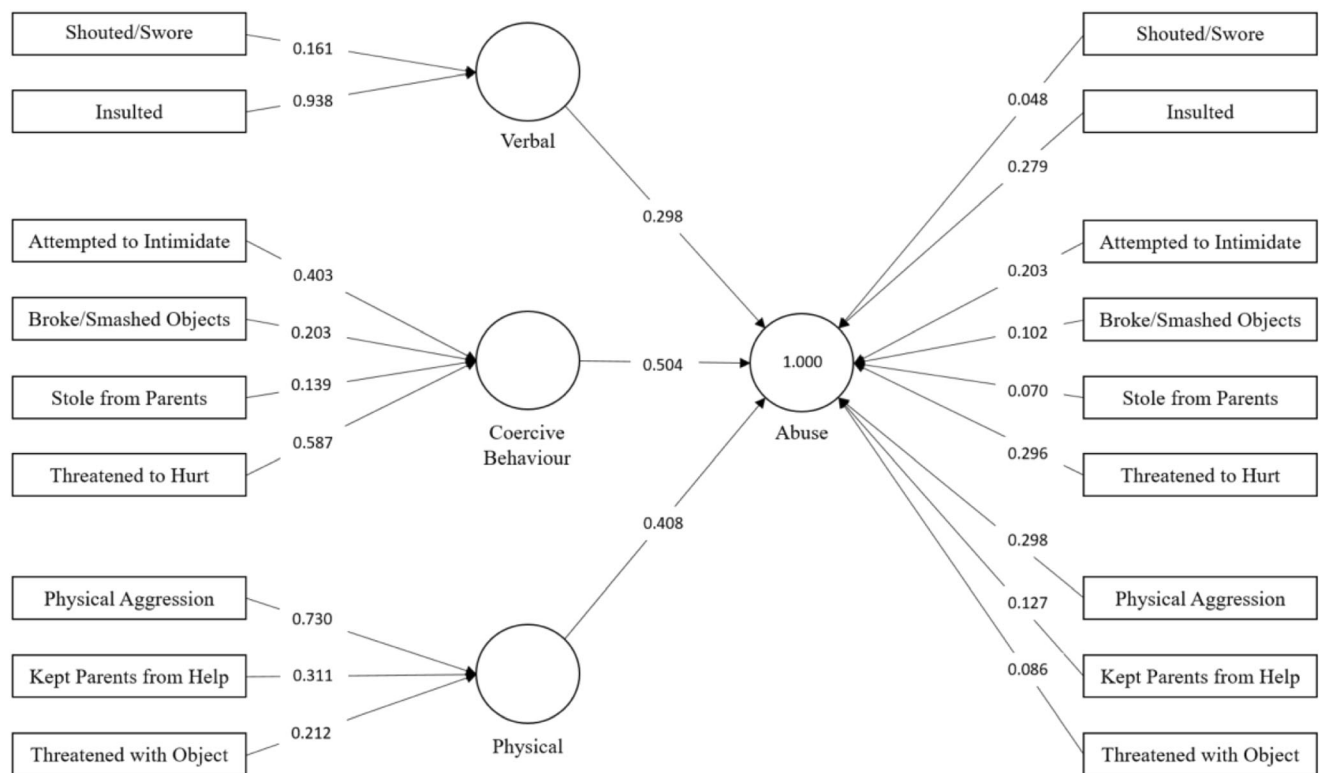


Fig. 1 Partial least squares model of the ABC-I in a youth sample

$p = .37$, $M_{\text{diff}} = .78$). Correlations (ρ) were used to compare the relationships between the total scores on the ABC-I and CPAQ. Overall, there was a moderate relationship between scores on the ABC-I and CPAQ for

both mothers ($\rho = .47$) and fathers ($\rho = .51$). However, the proportion of participants categorised as abusive by the CPAQ was significantly different to the proportion categorised by the ABC-I for mothers ($\chi(1) = 73.39$,

Table 3 Proportion of Participants engaging in any aggressive behaviour and behaviour that exceeded the threshold of abuse towards their Parents

	Behaviour	Verbal Aggression		Coercive Behaviour		Physical Aggression		Overall		
		Fathers <i>n</i> (%)	Mothers <i>n</i> (%)	Fathers <i>n</i> (%)	Mothers <i>n</i> (%)	Fathers <i>n</i> (%)	Mothers <i>n</i> (%)	Fathers <i>n</i> (%)	Mothers <i>n</i> (%)	Either <i>n</i> (%)
Sons	Any aggression	48 (49)	74 (57)	25** (24)	33* (26)	—	—	54 (52)	77 (60)	81 (68)
	Abuse	3 (3)	2 (2)	10 (10)	14 (11)	8 (8)	7 (9)	17** (17)	24 (19)	31** (24)
Daughters	Any aggression	165 (46)	287 (64)	42** (12)	69* (15)	—	—	176 (49)	291 (65)	314 (80)
	Abuse	8 (2)	15 (3)	19 (5)	32 (7)	13 (4)	29 (7)	29** (8)	59 (13)	65** (14)
All participants	Any aggression	215 (46)	363 (63)	67 (14)	103 (18)	—	—	231 (50)	370 (64)	397 (68)
	Abuse	11 (2)	17 (3)	29 (6)	46 (8)	22 (5)	38 (7)	47 (10)	84 (15)	98 (16)

Prevalence of any physical aggression was omitted from table because any act meets the threshold for abuse. Sample size varies ($n_{\text{father-son}} = 80$; ($n_{\text{father-daughters}} = 235$; $n_{\text{mother-son}} = 106$; $n_{\text{mother-daughters}} = 321$)

* $p < .05$; ** $p \leq .001$ Chi-Square tests compare differences in behaviour of sons and daughters. Differences between father and mother abuse could not be investigated because these are not mutually exclusive categories

$p < .001$, $V = .74$) or fathers ($\chi(1) = 54.86$, $p < .001$, $V = .74$). For fathers, 78% ($n = 28$) of those categorised as abusive on the CPAQ were not abusive according to the ABC-I and 33% ($n = 4$) who were categorised as abusive on the ABC-I were not abusive the CPAQ. Similarly, 72% ($n = 44$) of mothers who were categorised as abusive on the CPAQ were not on the ABC-I and 38% ($n = 8$) who were categorised as abusive on the ABC-I were not on the CPAQ.

The 9-item structure of the ABC-I was tested on the sample from Study 1. The model was fair ($KMO = .75$) and the determinant of the matrix was acceptable at .01011. The RMSR was acceptable (0.081; 95% CI: .05–.11; Harman 1962). The three components explained 73% of the variance. The cut off score of 16 was sufficient (sensitivity = .79; specificity = .85).

Discussion of Study 2

A PLS model confirmed the ABC-I's three-component structure in a sample of young people. Two items (i.e., shouting at and swearing at a parent) were collapsed, resulting in a 9 item index divided into three sub-indices. This structure was also found to demonstrate appropriate fit in the parents' sample when analyses were rerun. Given its fit in samples of both parents and children, the 9-item, three-component structure is the advised structure for the ABC-I.

According to the 9-item structure of the ABC-I and the culturally-relevant total score threshold of abuse (16), 16% of participants were categorised as being abusive towards their parents within the past year. This is well below other estimates of overall CPA perpetration (e.g., Browne and Hamilton 1998 [CTS]; Fawzi et al. 2013 [APQ]; Ibabe et al. 2013 [CPAQ]). When considering only the prevalence of physically abusive behaviour, the frequency rates in our study were akin to Browne and Hamilton's (1998) study of CPA perpetration among English university students, as well as other physical abuse research (e.g., Ibabe et al. 2013). The lower rate of identified psychological and coercive abuse differentiates our results from past research.

Notably, while relatively few participants met the cut-off for verbal abuse on the ABC-I, a similar proportion of participants reported using verbal aggression against their parents as described in previous research (i.e., 46–63%; Calvete et al. 2013; Pagani et al. 2009). The ABC-I's novel scoring procedure means that it is the first instrument that is able to differentiate non-physical abuse from occasional disrespectful or bad behaviour, according to local social norms for what constitutes abuse. The unique scoring procedure also

explains why abuse status on the ABC-I was only moderately related to participants' CPAQ scores, as participants who occasionally used verbal aggression or coercive behaviour towards their parent would have elevated CPAQ scores but would not be categorised as abusive on the ABC-I.

Overall, females were less likely to be abusive towards their parents according to the ABC-I, contradicting most previous research in community samples using adolescent participants (e.g., Agnew and Huguley 1989; Ibabe and Bentler 2016; McCloskey and Lichter 2003). The unusual gender difference in this sample appeared to be related to a higher rate of father abuse by sons compared to daughters. These findings are consistent with past research which has showed that sons are more likely than daughters to abuse their fathers (Agnew and Huguley 1989; Walsh and Krienert 2007). Further, as our sample ($M_{age} = 20.44$) was older than most found in CPA research (Simmons et al. 2018), these results may provide evidence for the hypothesis that the pattern of abuse changes with increased age. CPA research suggests that females desist from CPA earlier than males (Snyder and McCurley 2008; Walsh and Krienert 2007) and that older males are more likely to direct more abuse towards their fathers than younger males (Peek et al. 1985; Walsh and Krienert 2007). However, as this was a cross-sectional study, this hypothesis could not be tested.

General Discussion

The aim of these studies was to develop culturally-relevant indices of CPA that could differentiate between abusive and normative behaviour, which has been highlighted as a necessity in this field within the last decade (Hollenstein and Loughheed 2013; Kennedy et al. 2010). In an Australian sample, a score of 16 on the ABC-I correctly classified four out of five cases of parent-reported abuse. This empirically derived threshold for abuse contributes significantly to the literature by improving specificity when detecting abuse, accounting for social norms and the overall pattern of the child's behaviour.

Instructions for Administering the ABC-I

The ABC-I is a novel tool which provides a unique approach to quantifying abuse. By scoring individual behaviours with reference to local social norms to identify whether the overall pattern of behaviour is abusive, the ABC-I provides an empirically derived threshold for abuse rather than relying only on researchers' opinions

of what is abusive (which may be strongly coloured by factors such as culture or class). The combination of social norms and self-reported experience presents a significant step for measurement of abusive behaviour. Appendix provides the scoring instructions and items for the ABC-I for youth.

To administer this tool in a sample of young people, separate responses should be given for each parent or guardian. The identity of the relevant parent (e.g., ‘your mother’) should be substituted for the phrase [a parent] within each item and throughout the ABC-I (see Appendix). When administering the tool with parents, the wording of the items can be changed to refer to their child’s behaviour. Depending on the context in which the tool is used, parents can complete an ABC-I for each individual child between the age of 14 and 25 years or complete an ABC-I based upon their most difficult child (even if they are hardly ever difficult). Any participant who receives a score of 16 or greater is considered to be abusive, regardless of whether the score results from a single behaviour, a category of behaviour (e.g., verbal, coercive, physical behaviour), or an overall pattern of behaviour in the past 12 months.

While it is advised that all measures are validated for each new population they are used in, this is not always done in practice. However, it is imperative that the BACPAQ (Simmons et al. 2019) and ABC-I be administered together in novel populations because definitions of CPA will likely vary across culture, as noted in child abuse research (The International Society for the Prevention of Child Abuse and Neglect, 2014). Future research outside of Australia would require administering the BACPAQ in tandem with the ABC-I to identify culturally-specific thresholds for abuse that can then be used to anchor item scores on the ABC-I (with the identified threshold frequency for abuse on a given item scoring 16 and scores around increasing and decreasing by a factor of 2).

Understanding CPA in Australia Using the ABC-I

According to the ABC-I, the overall prevalence of CPA in the youth sample was 16%. The rate of physical abuse (7%) was relatively consistent with past research (e.g., Cornell & Gelles, 1982; Ibabe et al. 2013). This is unsurprising, given that one incident of physical aggression is sufficient to be considered abusive by most Australian parents (Simmons et al. 2019). As such, frequency scales such as the CPAQ would be adequate for measuring the presence of physical abuse (in Australia, at least). Conversely, while the frequency of verbal aggression reported by participants (46–63%) was

consistent with previous research that used a simple frequency count to define the presence of abuse, the frequency of verbal abuse in Study 2 (16%) was considerably lower than previous research (e.g., >33%; Calvete et al. 2013). This suggests that young people in the current sample reported similar behaviours as those in previous research, but the ABC-I demonstrated greater specificity in differentiating between normative and abusive behaviour than has been possible with previous measures.

Limitations and Future Directions

This research provides evidence for the utility and validity of the ABC-I. However, as the final ABC-I was not the one completed by participants, future research should confirm the structure of the indices by administering only the collapsed items and reduced rating scale. Additionally, due to difficulties with recruiting fathers, the parent participant sample was primarily mothers. Future research would benefit from greater recruitment of fathers, and potentially by specifying responses on the BACPAQ by child’s gender, as it is possible (or even likely) that social norms about CPA are gender-sensitive. Finally, this paper aimed to develop the ABC-I, rather than to explore individual differences in abusive behaviour. Future research would benefit from considering differences in scores on the ABC-I according to age, gender, whether the youth is living with their parent, socio-economic status, and psychological characteristics so that we may better understand the phenomenon of CPA in Australia.

Conclusions

The ABC-I measures child-to-parent abuse using a novel scoring procedure that considers the frequency and severity of the behaviour, as well as the norms of the culture in which the behaviour occurs. According to the ABC-I, 16% of our Australian sample were abusive towards their parents, with sons being more likely to be abusive than daughters. Mothers and fathers were equally likely to have been abused by their children, although fathers were more likely to be abused by their sons. These results highlight that CPA is a relatively common issue within Australia and it is not restricted to children under the age of 18, as much past research has assumed. The development and validation of the ABC-I means that future research into CPA will be better able to discriminate abusive from disrespectful youth in a consistent way. This in turn will assist in developing understanding that can inform prevention and intervention efforts for this common problematic behaviour.

Appendix

The ABC-I						
<i>Below is a list of behaviours. Please indicate whether you have behaved in the following ways towards [a parent] within the past 12 months.</i>						
	Never	Once	A few times	Monthly	Weekly	Daily
1. Shouted or swore at [a parent]	0	1	2	4	8	16
2. Insulted or humiliated [a parent]	0	1	2	4	8	16
3. Attempted to intimidate [a parent]	0	8	16	32	64	128
4. Stole money or possessions from [a parent]	0	8	16	32	64	128
5. Threatened to hurt self or others if [a parent] did not do what the child wanted	0	8	16	32	64	128
6. Broke, smashed objects in the house, or threatened to do so	0	4	8	16	32	64
7. Kept [a parent] from seeking help or medical care	0	16	32	64	128	256
8. Threatened [a parent] with an object	0	16	32	64	128	256
9. Acted physically aggressively towards [a parent] (e.g., pushed, grabbed, punched, kicked, burn, strangle, used weapon against, etc.)	0	16	32	64	128	256

Please check all physically aggressive behaviours that you used against [a parent] in the past 12 months: ☐ threw something at them ☐ pushed ☐ grabbed ☐ hit or slapped ☐ punched ☐ kicked ☐ strangled ☐ used a weapon against ☐ burned or scalded on purpose ☐ other _____

Please check if you injured [a parent] in the past 12 months:
☐ minor injury (e.g. cuts, bruises) ☐ major injury (e.g., broken bones or teeth, head injury)

Scoring Procedure (the above scoring matrix is based on Australian parental norms about thresholds for abuse and will need to be reset using the BACPAQ in any novel population):
 Verbal Aggression = 1 + 2; Physical Aggression = 7 + 8 + 9;
 Coercive Behaviour = 3 + 4 + 5 + 6; Total Score = 1+2+3+4+5+6+7+8+9

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Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

