American Psychologist

ISSN: 0003-066X

2021, Vol. 76, No. 2, 253–267
https://doi.org/10.1037/amp0000760

Capturing the Developmental Timing of Adverse Childhood Experiences: The Adverse Life Experiences Scale

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Adverse childhood experiences (ACEs) have been associated with a range of physical and mental health problems, and it is now understood that the developmental timing of ACEs may be critically important. Despite this, there is a distinct lack of methods for the efficient assessment of such timing in research and clinical settings. We report on the development and validation of a new measure, the Adverse Life Experiences Scale (ALES), that indexes such developmental timing within a format incorporating caregivers' reports of ACEs in their own lives and those of their children. Participants were a nationally representative sample of Australian families (n = 515; Study 1), and a sample of clinic-referred families (n = 168; Study 2). Results supported the internal consistency and test–retest reliability of the ALES and indicated high levels of acceptability for the measure. In terms of validity, ALES scores were significantly associated with interview-based measures of child maltreatment and quality of the family environment, as well as measures of psychopathology across multiple informants (parents, teachers, clinician-rated). Furthermore, indices of ACEs occurring within specific age-based periods of childhood were found to explain unique variance in current symptoms of child and caregiver psychopathology, independent of the overall chronicity of those ACEs and current adversity.

Public Significance Statement

The collection of valid and reliable data on adverse childhood experiences (ACEs) is important to research and clinical practice in a range of settings. The Adverse Life Experiences Scale is a new measure of ACEs that is designed to index the occurrence and developmental timing of such experiences, both in the lives of parents and their children. This is important because existing measures have typically neglected such timing, while focusing on parents and children in isolation.

Keywords: adverse childhood experiences, psychopathology, assessment

Supplemental materials: https://doi.org/10.1037/amp0000760.supp

Adverse childhood experiences (ACEs), including child abuse, domestic violence, and major disruptions to caregiving, are understood to be highly intercorrelated, and when factored together robustly predict a broad range of physical, developmental, and psychological problems (Felitti et al., 1998). In terms of mental health, ACEs have been implicated not only in those disorders typically associated with traumatic events (e.g., posttraumatic stress disorder; Brockie et al., 2015), but also the most prevalent forms of child and adult psychopathology, including common anxiety and mood disorders, suicidal behavior, and disruptive behavior disorders and delinquency (Cavanaugh et al., 2015; Fox et al., 2015; Hughes et al., 2017). Emerging research across a range of countries has indicated that while some cross-cultural variations in ACEs and associated mental health outcomes are apparent, the long-term effects of ACEs on health and development appear to be relatively consistent across cultures (Hughes et al., 2017; Massetti et al., 2020). In this article we examine the potential for

Editor's note. This article is part of a special issue, "Adverse Childhood Experiences: Translating Research to Action," published in the February–March 2021 issue of *American Psychologist*. Sharon G. Portwood, Michael J. Lawler, and Michael C. Roberts served as editors of the special issue.

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emerging developmental perspectives concerning the timing of ACEs to inform translational research, policy, and practice. We report on the development of the Adverse Life Experiences Scale (ALES), a novel measure of ACEs designed to index key dimensions of this timing in research and clinical settings, and outline its recent use with families in a center for the treatment of conduct problems and related disorders.

In recent years there has been considerable interest in the widespread screening of ACEs in health care settings for purposes of prevention and early intervention. However, as noted by Finkelhor (2018), the issue of whether such screening is justified carries with it the important question of "*What exactly should we be screening for?*" Research to date has been based largely on a cumulative risk approach to ACEs and screening has therefore focused on the overall number of adversities experienced by the individual during childhood. Such an approach, however, is at odds with a growing body of research regarding the complex transactional processes through which ACEs influence mental health across child and adolescent development (McLaughlin & Sheridan, 2016). This includes evidence that the precise impact of ACEs on the developing child may depend on the specific ages at which environmental insults are experienced. Longitudinal research by Schroeder et al. (2018) for example, found that externalizing problems in middle childhood were explained in part by the timing and duration of ACEs during early childhood, independent of cumulative adversity. Additionally, epigenetic effects associated with mental health have been linked to the occurrence of ACEs during some periods of infancy and early childhood but not others (Dunn et al., 2019). This has important implications for theoretical models of environmental contributions to mental health disorders, as well as the methodological approaches used to collect data on early life experiences related to such disorders. It suggests that for assessment methods to identify adverse experiences of key importance to mental health they must be able to provide information not only about the type, but also the specific timing of such experiences. Moreover, growing literature has highlighted the need for such methods in both research and clinical practice settings (Lacey & Minnis, 2020).

Recent reviews have highlighted a number of key limitations among existing measures of ACEs (see Barnes et al., 2020; Oh et al., 2018). First, such measures are often time consuming and burdensome, and tools for assessing the developmental timing of adversities often involve lengthy interviews. Second, existing screeners provide limited information about the timing and duration of adverse events. Questionnaires that do index such timing typically do not do so in relation to specific adversities, or in terms of the specific ages at which they occurred. For example, the Childhood Experience of Care and Abuse Questionnaire (CECAQ; Bifulco et al., 2005) identifies the ages at which some adversities (e.g., physical punishment, unwanted sexual experiences) first began, but does not index how long they lasted for. Third, few tools have been developed for measuring exposure to adverse experiences in young children, despite these children being the most vulnerable to adversities such as maltreatment (Oh et al., 2018). Finally, despite evidence regarding the role of ACEs in the intergenerational transmission of psychopathology (Lê-Scherban et al., 2018; McDonnell & Valentino, 2016), the measures that are currently available to assess adversity in a parent's developmental history are largely separate to those for the assessment of adversity in the life of a child. Researchers investigating intergenerational aspects of adversity may therefore be forced to combine unrelated child and adult measures or use original measures that have not been validated for this purpose. Accordingly, recent reviews have not only highlighted the need for easily administered measures of ACEs that are suitable for clinical settings (Oh et al., 2018), but have called for two-generation initiatives whereby assessment and intervention encompasses both child and caregiver experiences (Barnes et al., 2020).

A further consideration of importance to such assessment concerns the scope of experiences that qualify as ACEs. While ACEs have typically been operationalized based on the inventory of 10 risk factor items (five concerning abuse and neglect, and five concerning family incapacities) used in Felitti et al.'s (1998) influential study, it has been noted that these items were not selected according to a systematic process of item selection (Finkelhor et al., 2015), and research published since that time has emphasized the potential for additional experiences to function similarly. This includes research using revised measures of ACEs, which

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found that peer victimization, peer isolation/rejection, and community violence added significantly to the prediction of mental health outcomes, and that low socioeconomic status added significantly to the prediction of physical health outcomes over and above the original 10 ACE items (Finkelhor et al., 2015). Calls to examine discrimination, refugee status, and exposure to war and conflict as potential ACEs have also been made in literature concerning the limitations of existing measures (Barnes et al., 2020; Mersky et al., 2017).

The ALES (Lechowicz et al., 2018) was developed in direct response to the evidence and issues outlined here. Accordingly, it was created as a brief caregiver self-report measure to index not only number and type of ACEs in the life of an individual, but the developmental timing and chronicity of these experiences. A broad range of distinct adversities are indexed, which include those of the original 10-item inventory, as well as additional experiences of victimization and abuse, minority adversities, and adverse life events, informed by current evidence and validated measures of ACEs (e.g., Finkelhor et al., 2005; Finkelhor et al., 2015; Gray et al., 2004; Zolotor et al., 2009). Furthermore, the ALES comprises two parallel components designed to assess the ACEs of a child and caregiver, respectively, thereby allowing for assessment of both concurrently. The major aims of the current research were to examine the reliability and validity of the ALES in children and their caregivers. The overarching research questions concerned the reliability and validity of the ALES in children and their caregivers. In addition to examining test–retest reliability, internal consistency, and population-based distributions of ALES indices, major aims were to examine caregiver reports on the ALES in relation to existing measures of child maltreatment and quality of family environment, and multi-informant data on child and adolescent psychopathology. This was done in two studies, first with a nationally representative sample of Australian families, and second with a sample of clinic-referred families of children with disruptive behavior disorders and comorbid psychopathology. Key tests in each involved the use of regression models to examine whether ACES within specific age-based periods of childhood explained unique variance in child and parent psychopathology, independent of ACEs chronicity and current adversities.

Study 1

The aims of Study 1 were to examine the reliability and validity of the ALES in a nationally representative sample of Australian families of typically developing children aged 2–12 years, and provide normative data on population-based distributions of ALES indices regarding number and timing of ACEs among children and their caregivers. A further aim was to examine the acceptability of the ALES among parents.

In line with existing research into ACEs and child psychopathology, which has focused largely on adversity in terms of overall exposure, hypotheses focused primarily on Total ALES scores. It was hypothesized, first, that ALES scores indexing children's overall ACEs would be positively associated with current child symptoms of posttraumatic stress disorder (PTSD) as well as overall psychopathology. Associations were expected to be medium in size, based on evidence of such associations between overall adversity and PTSD (Hastings & Kelley, 1997), internalizing symptoms (Allen et al., 2008), and externalizing symptoms (Counts et al., 2005) in child samples. Second, we hypothesized that ALES scores indexing parents' overall ACEs would be positively associated with current psychological distress. Based on evidence of associations between ACEs and adult anxiety and depression (Hughes et al., 2017), associations were likewise expected to be medium in size. Third, indices of ACEs occurring within specific age-based periods of childhood were hypothesized to explain unique variance in symptoms of current child and parent psychopathology, independent of ACEs chronicity and current adversities. Fourth, the ALES was predicted to demonstrate acceptable test–retest reliability across a 3- to 6-week period.

Method

Participants

Participants were parents/caregivers in families with at least one child between the ages of 2 to 12 years. Parents were aged 18–69 years (M = 39.85; SD = 7.89); 56%

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were mothers; 88.2% were married or in de facto relationships; 42.33% had completed a university degree; and family income (AUD) ranged from <$40,000 (12.62%), $41,000–$100,000 (37.86%), and >$100,000 (44.27%). For reference, the average yearly household income for the general population of Australia is $116,584. They had an average of two children (SD = 1.06, range = 1–8). Ethnicity was predominantly Caucasian/European (71.8%), followed by East/South-East Asian (10.5%); Aboriginal or Torres Strait Islander (2.7%); and Middle-Eastern (1.4%). Parents with more than one child completed the child measures based on their oldest child (M = 7.68 years; SD = 3.19; 49% girls).

Sampling Procedure

Inclusion criteria included being an Australian resident, a parent/caregiver of at least one child between the ages of 2 to 12 years, and basic English literacy. Recruitment occurred via an independent online research panel (Qualtrics), through which participants were remunerated. Participants were sampled to represent Australian families of children in this age range based on Australian Census data regarding: marital status, socioeconomic status (annual household income and education level), ethnicity, age, and gender, for parents of children aged 2–12 years.

Measures

The ALES (see online supplementary materials for items) is a caregiver report questionnaire that assess adversities that have occurred in a caregiver's own life as well as in the life of their child. The measure comprises distinct caregiver and child components, both of which consist of 24 yes/no risk factor items (coded 1/0 for scoring) concerning exposure to the same respective adversities. Corresponding ratings of the developmental timing of this exposure are made when items are endorsed. For children, these developmental ratings are made by indicating whether or not exposure to the respective risk factor occurred during five discrete fine-grained age categories (0–1; 2–3; 4–5; 6–8; 9–12 years). For caregivers, additional age categories of "adolescence" (13–17 years) and "adulthood" (18+ years) are also included, along with ratings of whether exposure occurred while the caregiver was pregnant, or during their life as a parent. For the purposes of the current study ALES scores were calculated for total lifetime ACEs (child total; caregiver total), by summing yes responses to all risk factor items to produce scores ranging 0–23. Item 24, which asks about "other" events/experiences not included in the previous items, is omitted from this total as a system for coding such responses is not yet available. Scores were also calculated for total ACEs within specific age categories by summing the number of times each age category was endorsed across the 23 risk factor items (child ACEs age 0–1 year; child ACEs age 2–3 years; child ACEs age 4–5, etc.; caregiver ACEs age 0–1 year; child ACEs age 2–3 years; caregiver ACEs age 4–5 years; etc.). Finally, scores indexing chronicity of ACEs were calculated by summing the number of age categories in which any risk factor item was endorsed, along with an age-corrected form of this index whereby this sum was divided by the age of the individual. Chronicity, as operationalized here, can therefore be defined as the overall duration of exposure to adversity, regardless of whether affected age periods are consecutive or not.

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) is a 25-item questionnaire consisting of subscales indexing five domains of child behavior and psychopathology (hyperactivity/inattention, conduct problems, emotional symptoms, peer problems, and prosocial behavior), and a Total Difficulties scale. It has demonstrated acceptable reliability and validity across a large number of international populations, including Australia (Hawes & Dadds, 2004). The current study utilized Total Difficulties, which showed good reliability in both the community (α = .85) and clinical samples (α = 78).

The Child Stress Disorder Checklist (CSDC; Saxe et al., 2003) is a 36-item checklist that assesses current symptoms of acute stress disorder and posttraumatic stress disorder based on past exposure to eight serious traumatic events. Subscales index core criteria for PTSD (reexperiencing, avoidance, numbing and dissociation, arousal, and impairment in functioning), and total posttraumatic stress (PTS). The internal consistency of this scale has been supported in previous research (α = .84;

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Saxe et al., 2003), and was strong in the current sample ($\alpha = 96$).

The Kessler Psychological Distress Scale (K6; Kessler et al., 2002) is a widely used six-item screening measure for psychological distress (e.g., nervousness, restlessness, depressed mood). It is widely used to screen for poor mental health in adult populations and has shown good internal consistency ($\alpha = .89$; Kessler et al., 2002) and strong psychometric properties in Australian samples (e.g., Furukawa et al., 2003). In the current sample the internal consistency of K6 scores based on the sum of these six items was strong ($\alpha = 93$).

Finally, parents' views on the acceptability of the ALES were assessed using ratings on novel scales created for this study. Items indexed confidence in reporting ("Based on your knowledge of events in your child's life, how confident are you in the accuracy of your responses?"; 3-point Likert response format); the appropriateness and clarity of item wording ("How appropriate did you find the wording of the questionnaire items?"; "How clear did you find the wording of the questionnaire items?"; 3-point Likert response format), and willingness to complete the ALES in a health care setting ("Would you be willing to complete the questionnaire if used in a routine assessment of child wellbeing at a health service?"; yes/no).

Data Collection

Measures were completed online by participants using their own electronic devices, in a single testing session at the time of their choosing. A random subset of 60 parents completed the ALES a second time 3–6 weeks later for test–retest reliability. Due to the online format of testing in this sample, data integrity was maximized using attention check items that required participants to repeat their child's date of birth at the beginning and end of the survey, thereby ensuring that participants were reporting on a real child. Among the 1,161 respondents who completed any part of the online testing, 467 were screened out due to exclusion criteria (e.g., not living in Australia: $n = 15$; not a parent: $n = 348$; not having a child in the relevant age range: $n = 104$). Respondents who failed the attention checks ($n = 179$) were further excluded, resulting in the final sample of 515 participants. The participants excluded due to the integrity check items did not differ significantly from those in the final sample on demographic variables such as parent level of education $t(695) = 0.44$, $p = .06$, or family income, $t(695) = 0.94$, $p = .78$.

Analytic Strategy

Normative population data on the ALES items were analyzed descriptively based on median numbers of total child and caregiver ACEs corresponding to the 50th, 75th, 90th, and 95th percentiles in the sample. Because the online survey required input for all items there was no missing data. Hypothesis 1 was tested using bivariate (Pearson) correlations to examine direct associations between ALES Child Total scores and indices of child PTSD and overall psychopathology (CSDC-PTS; SDQ Total Difficulties). Hypothesis 2 was similarly tested using correlations between ALES Caregiver Total scores and K6 scores. Hypothesis 3, regarding unique associations between ACEs within specific age-based periods and current child and parent symptoms, was tested in separate analyses of data on child and parent ACEs, respectively, as follows.

With regard to child ACEs, unique associations between parents' ratings of their child's ACEs and mental health symptoms were examined in four regression models testing predictors of overall symptoms of child psychopathology (dependent variable [DV]: SDQ Total Difficulties), and PTSD (DV: CSDC Posttraumatic Stress total score), in boys and girls respectively. Each model comprised the same covariates/independent variables (IVs). In order to test whether parent ratings of the overall chronicity of ACEs in the child's life predicted current symptom severity, the IV chronicity of ACEs was entered in a first block, along with the covariate child age. In order to test whether indices of developmental timing based on the occurrence of ACEs within specific age-based periods explained unique variance in these symptoms above and beyond the overall chronicity of ACEs, IVs in Block 2 consisted of ALES scores corresponding to number of child ACEs at age 0–1 year; age 2–3 years; age 4–5 years; age 6–8 years; and age 9–12 years. Hypothesis 3 was then tested using data on caregiver ACEs in two linear regression models testing predictors of K6 total scores (DV), for mothers and fathers, respectively. Block 1 of each model comprised the covariates/IVs parent

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age and chronicity of ACEs. Due to high correlations among parents' reports of their own ACEs in the fine-grained ALES age categories (ranging from $r = .42–.82$), ACEs at age 2–3 years, 4–5 years, and 9–12 years, were combined to form a childhood ACEs composite variable in order to overcome multicollinearity. Accordingly, the IVs entered in Block 2 consisted of the number of ACEs parents experienced during infancy (age 0–1 year); childhood (age 2–12 years); and adolescence. In order to test whether ACEs predicted current mental health symptoms independent of current adversity, Block 3 of each model comprised the number of ALES risk factors endorsed by the caregiver during adult life. Finally, Hypothesis 4 regarding test–retest reliability was tested using the intraclass correlation coefficient (ICC).

Results

Reliability

Strong internal consistency was found for scales based on total number of endorsed risk factor items in the lives of caregivers (ALES Caregiver Total: $\alpha = .86$) and their children (ALES Child Total: $\alpha = .80$), respectively. This reliability was comparable to that seen for the items based on the 10 risk factors of the original ACEs inventory when calculated from the ALES (child ACEs: $\alpha = .77$; caregiver ACEs: $\alpha = .82$). Total scores based on these 10 items were highly correlated with those based on the full ALES items (child ACEs: $r = .88$, $p < .001$; caregiver ACEs: $r = .92$, $p < .001$). Among the subset of parents who completed the ALES a second time 3–6 weeks later, acceptable test–retest reliability was seen both for ALES Child Total (ICC = .85) and ALES Caregiver Total (ICC = .88).

Normative Population Data

The rates at which each ACE was endorsed by caregivers for children in the representative community sample at various ages are reported in Table 1. As expected, total numbers of lifetime ALES ACEs at the population level varied depending on children's ages at the time of testing. Among early childhood (2–5 years) aged children, 57.9% had experienced at least one ACE, and those scoring at the 50th, 75th, 90th, and 95th percentiles on the ALES had reportedly been exposed to median numbers of one, three, five, and seven ACEs, respectively. Among middle childhood (6–12 years) aged children, 76.2% had experienced at least one ACE, and 50th, 75th, 90th, and 95th percentiles corresponded to two, five, seven, and nine ACEs, respectively. Rates of children's exposure to at least one ACE within each of the fine-grained ALES age categories were 23.7% (age 0–1 year); 38.3% (age 2–3 years); 44.7% (age 4–5 years); 60.67% (age 6–8 years); 60.9% (age 9–12 years). Across these age categories, the specific ACEs that were most prevalent within each related to two items: "Lived with someone with mental illness" (13% age 0–1 year; 17.4% age 2–3 years; 16% age 4–5 years); and "Hurt/threatened/picked on by peers" (27.4% age 6–8 years; 32.8% age 9–12 years). The least prevalent item was "Exposed to war" (0.2% lifetime occurrence). The median number of ACEs occurring within each of these age categories for children at the 95th percentiles on the ALES were two (age 0–1 year); four (age 2–3 years); five (age 4–5 years); six (age 6–8 years); five (age 9–12 years). When these fine-grained age categories were collapsed into the conventional developmental periods of infancy (0–1 year); early childhood (2–5 years) and middle childhood (6–12 years), chronicity of exposure among participants in the middle childhood age range at the time of testing ($n = 370$) was limited to only one developmental period for 34.1% of these children, spanned two developmental periods for 23.8%, and spanned all three periods for 18.4%.

According to caregivers' reports of their own ACEs, 65% experienced at least one of the ALES risk factors prior to adulthood. With regard to median numbers of ACEs, caregivers corresponding to the 50th, 75th, 90th and 95th percentiles of ALES Caregiver Total scores reported experiencing two, five, eight, and 10 ACEs, respectively. Among caregivers, rates of exposure to at least one ACE within each of the fine-grained ALES age categories were 9.9% (age 0–1 year); 16.3% (age 2–3 years); 24.7% (age 4–5 years); 34% (age 6–8 years); 44.3% (age 9–12 years); 54% (adolescence). When these fine-grained age categories were collapsed into the conventional developmental periods of infancy (0–1 year); early childhood (2–5 years); middle childhood (6–12 years), and adolescence, chronicity of ex-

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posure among caregivers ($n = 515$) was limited to only one developmental period for 21.6% of caregivers, spanned two developmental periods for 20.2%, three for 15.3%, and all four for 8%.

Criterion Validity

At the bivariate level, ALES Child Total was associated with CSDC Posttraumatic Stress Total, $r = .64$, $p < .001$ and SDQ Total Difficulties, $r = .48$, $p < .001$. Although the ALES Total was of primary interest, the numbers of ACEs within each of the fine-grained ALES age categories were also significantly correlated with SDQ Total Difficulties and CSDC Posttraumatic Stress Total (all $r = .20–.43$, $p < .001$). Chronicity of ACEs (corrected for children age) likewise showed significant zero-order associations with both SDQ Total Difficulties, $r = .32$, $p < .01$ and CSDC Posttraumatic Stress Total, $r = .25$, $p < .01$.

Results for the four regression models used to test Hypothesis 3 in relation to child ACEs, as outlined in the Analytic Strategy section, are as follows (see Table 2 for coefficients). Overall symptoms of psychopathology in girls were predicted by chronicity of ACEs ($\beta = .39$, $p < .01$) and child age ($\beta = -.18$, $p < .01$) in Block 1, while the full model comprised main effects for number of ACEs at age 2–3 years ($\beta = .19$, $p < .01$); age 4–5 years ($\beta = .17$, $p < .05$); and age 9–12 years ($\beta = .14$, $p < .05$). Similarly for boys, overall symptoms were predicted by chronicity of ACEs in Block 1 ($\beta = .33$, $p < .01$), with the full model comprising main effects for number of ACEs at age 2–3 years ($\beta = .25$, $p < .01$); age 4–5 years ($\beta = .24$, $p < .01$); age 6–8 years ($\beta = .22$, $p < .01$); and age 9–12 years ($\beta =$

Table 1
Rates at Which ALES Items Were Endorsed at Any Age (Lifetime) and Within Discrete Age Periods Among Children Aged 2–12 Years (N = 515)

Adverse Life Experiences Scale Items	Lifetime	0–1 year	2–3 years	4–5 years	6–8 years	9–12 years
	N (%)	%	%	%	%	%
1. Seriously ill or injured or been in a serious accident	87 (16.9)	4.7	5.6	6.2	3.4	1.6
2. Missed out on important part of education	58 (11.3)	0.8	1.9	5.9	6.2	4.7
3. Felt lonely or been rejected or excluded by peers	167 (32.4)	1.0	6.5	12.3	24.3	31.3
4. Been hurt, threatened, or picked on /insulted by other children	157 (30.5)	0.8	5.6	10.1	24.7	32.8
5. Affected by a natural disaster (e.g., flood, fire, cyclone)	28 (5.4)	<.1	1.0	2.0	3.4	9.4
6. Very poor or serious financial problems	148 (28.7)	5.8	11.5	12.1	17.8	9.4
7. Lived in dangerous neighborhood or where saw people being hurt	30 (5.8)	1.2	1.9	3.2	2.7	1.6
8. Not enough to eat, unsupervised, not taken to a doctor when needed	18 (3.5)	0.8	1.3	1.7	2.7	<.1
9. Adult has repeated sworn at, insulted, threatened to hurt	39 (7.6)	1.2	3.8	3.5	4.5	6.3
10. Felt unloved or unimportant by family	63 (12.2)	0.4	2.7	5.2	8.9	9.4
11. Separated from/lost someone dependent on (e.g., foster care, war, death)	53 (10.3)	2.1	3.3	2.5	4.8	9.4
12. Witnessed family member hurt or threatened by another in household	79 (15.3)	1.2	6.1	7.7	11.3	4.7
13. Lived with someone who misused drugs or alcohol	43 (8.3)	4.1	5.6	5.7	6.8	4.7
14. Lived with someone with depression, mental illness, attempted suicide	141 (27.4)	13.0	17.4	16.0	20.9	17.2
15. Family member arrested, jailed, or taken by authorities	47 (9.1)	1.9	2.9	2.7	4.8	7.8
16. Left country due to war, violence, or persecution	2 (0.4)	0.2	<.1	0.2	<.1	<.1
17. Discriminated against or felt like an outsider due to race/gender/religion	32 (6.2)	0.4	1.3	2.2	6.5	6.3
18. Isolated or removed from a community, cultural group, or land	8 (1.6)	0.6	0.6	0.5	0.7	<.1
19. Been pushed, grabbed, slapped, or injured by an adult	52 (10.1)	1.0	5.0	4.0	4.1	4.7
20. Been forced into sexual acts or forced to look at sexual things	7 (1.4)	0.2	0.4	0.5	0.3	1.6
21. Seen others seriously injured or killed, or repeatedly heard about	17 (3.3)	0.4	0.8	1.2	0.3	3.1
22. Exposed to war	1 (0.2)	0.2	<.1	<.1	<.1	<.1
23. Had a sibling, close family or close friend die	119 (23.1)	2.7	4.8	7.2	12.7	17.2

Note. Participants contributing to rates within each discrete age period were restricted to those whose age matched or exceeded the upper range of that period.

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.18, $p < .01$). Symptoms of PTSD in girls were predicted by chronicity of ACEs in Block 1 ($\beta = .33$, $p < .01$), whereas the final model consisted of main effects for ACEs at age 0–1 year ($\beta = .23$, $p < .05$); age 4–5 years ($\beta = .38$, $p < .01$); and age 9–12 years ($\beta = .34$, $p < .01$). With regard to symptoms of PTSD in boys, no predictors were significant in Block 1, while in the full model main effects were seen for number of ACEs at age 0–1 year ($\beta = .68$, $p < .01$); and age 4–5 years ($\beta = .43$, $p < .01$).

With regard to parents' own ACEs and mental health symptoms, bivariate correlations indicated that K6 Total scores were significantly associated with ALES Caregiver Total (mothers: $r = .50$, $p < .001$; fathers: $r = .25$, $p < .001$; combined: $r = .38$, $p < .001$); total numbers of ACEs within each of the fine-grained ALES age categories (all $r = .27$-$.38$, $p < .001$); and chronicity of caregiver ACEs, $r = .32$, $p < .001$. Results for the two regression models used to test Hypothesis 3 in relation to parent ACEs, as outlined in the Analytic Strategy section, are as follows (see Table 2 for coefficients). For mothers, chronicity of ACEs ($\beta = .39$, $p < .01$) was a significant predictor in Block 1, but not in the final model, which comprised main effects for number of ACEs in childhood ($\beta = .29$, $p < .01$), and adulthood ($\beta = .32$, $p < .01$). For fathers, chronicity of ACEs ($\beta = .39$, $p < .01$) was a significant predictor in Block 1, but not the final model, in which the only main effect was for number of ACEs in adolescence ($\beta = .21$, $p < .05$).

Acceptability of the ALES

Caregivers' ratings of dimensions related to the acceptability of the ALES indicated that the vast majority (mothers: 81.5%; fathers: 73.6%) found the wording of the ALES items to be very appropriate, and very clear (mothers: 89.5%; fathers: 88.9%). Extremely few parents (mothers: 1.05%; fathers: 0%) reported that they were not confident in their responses to the ALES items, while the majority (mothers: 82.23%; fathers: 85%) were very confident. The vast majority (mothers: 87.8%; fathers: 87.2%) also indicted that they would be willing to complete the ALES as part of a routine assessment at a health service. Importantly, this pattern of responses held when examined among caregivers at the 95th percentile for ALES scores, indicating that these ratings of high acceptability were not confounded by those participants with few ACEs to report.

Study 2

The aims of Study 2 were to examine the reliability and validity of the ALES among clinic-referred families of children with disruptive behavior disorders and comorbid

Table 2
ALES Indices of Child ACEs as Predictors of Parent-Reported Child Psychopathology in the Community Sample (N = 515)

	Overall symptoms (SDQ Total Difficulties)						Posttraumatic stress symptoms (CSDC)					
	Boys ($n = 257$)			Girls ($n = 258$)			Boys ($n = 84$)			Girls ($n = 81$)		
Predictor variable	B	*SE*	β	B	*SE*	β	B	*SE*	β	B	*SE*	β
Block 1												
Child age	−0.12	0.13	−0.05	−0.34	0.12	−0.18**	−0.07	0.52	−0.01	−0.40	0.32	−0.16
Chronicity of ACEs	−0.58	0.44	−0.10	0.20	0.46	0.04	−2.02	1.38	−0.18	−1.91	1.08	−0.27
Block 2												
ACEs 0–1 year	0.05	0.34	0.01**	−0.34	0.36	−0.06	4.05	0.76	0.66**	1.20	0.60	0.22*
ACEs 2–3 years	0.85	0.26	0.24**	0.84	0.31	0.19**	−0.69	0.69	−0.13	−0.20	0.73	−0.03
ACEs 4–5 years	0.78	0.21	0.24**	0.72	0.34	0.17*	2.02	0.43	0.43**	1.82	0.64	0.38**
ACEs 6–8 years	0.77	0.25	0.22**	0.58	0.15	1.87	0.94	0.65	0.16	1.16	0.64	0.25
ACEs 9–12 years	0.69	0.24	0.18**	−0.56	0.28	0.14*	0.20	0.56	0.03	1.52	0.52	0.33**

Note. ACEs = adverse childhood experiences; SDQ = Strengths and Difficulties Questionnaire; CSDC = Child Stress Disorder Checklist; CSDC posttraumatic stress scores are calculated only for those children exposed to a severe traumatic event.
* $p < .05$. ** $p < .01$.

psychopathology. It was predicted that reports on the ALES would be associated with interview-based measures of child maltreatment and quality of the family environment, as well as measures of psychopathology across multiple informants (parents, teachers, clinician-rated). It was again predicted that in this sample indices of ACEs occurring within specific age-based periods of childhood would explain unique variance in current symptoms of child and caregiver psychopathology, independent of the overcall chronicity of those ACEs and current adversity.

It was hypothesized, first, that ALES scores indexing children's overall ACEs would be positively associated with interview-based measures of child maltreatment and negatively associated with quality of the family environment. The basis for this prediction was that child maltreatment and quality of family environment form core components of ACEs, yet because the ACEs construct is broader in scope than either, medium rather than strong levels of convergence were expected. Second, ALES scores were hypothesized to be positively associated with current symptoms of child psychopathology, as measured by parent, teacher, and clinician-ratings. Third, we hypothesized that ALES scores indexing parents' overall ACEs would be positively associated with their current psychopathology. These associations were again expected to be medium in size based on the literature reviewed. Fourth, indices of ACEs occurring within specific age-based periods of childhood were hypothesized to explain unique variance in current child and caregiver psychopathology, independent of ACEs chronicity and current adversities. Fifth, the ALES was predicted to demonstrate acceptable test–retest reliability across a 10-week period.

Method

Participants

Participants were families of 168 children aged 2–9 years ($M = 5.50$; $SD = 1.78$). Parents consisted of 166 mothers aged 28–49 years ($M = 40.22$; $SD = 5.05$); and 140 fathers aged 29–69 years ($M = 42.97$; $SD = 7.12$); 86.3% were married or in de facto relationships; 71.9% of mothers (52.8% fathers) had completed a university degree, and family income (AUD) ranged from <$40,000 (9.9%), $41,000-$100,000 (15.2%), and >$100,000 (57.7%). Participants were predominantly Caucasian/European (74%), followed by East/South-East Asian (11%); and Middle-Eastern (4.5%). Among the clinic referred children, 89.1% met *DSM–5* criteria for a diagnosis of an externalizing disorder (e.g., conduct disorder, oppositional defiant disorder, attention-deficit/hyperactivity disorder); and 21.1% met criteria for a diagnosis of an internalizing disorder (e.g., separation anxiety disorder, specific phobia, generalized anxiety disorder, major depressive disorder). All participants in the sample had some level of externalizing symptoms, while 51% also had internalizing symptoms.

Sampling Procedure

Inclusion criteria included families being clinic-referred for the treatment of a disruptive behavior disorder or comorbid psychopathology, along with functional English, no major neurological/physical illness, and a child IQ >70. Recruitment occurred via The University of Sydney Child Behavior Research Clinic, a mental health service for children aged 2 to 9 years, in Sydney, Australia.

Measures

The ALES and SDQ were again administered in Study 2 (for details see Study 1). In addition to parent reports, teacher reports were available for a subset of 138 cases. Internal consistency for the SDQ was strong for all informants (mothers: $\alpha = .78$; fathers: $\alpha = .78$; teachers: $\alpha = .88$).

The Diagnostic Interview Schedule for Children, Adolescents and Parents (DISCAP; Johnson et al., 1999) is a semistructured diagnostic interview used with parents, and the child for those older than 8 years. It provides both categorical and continuous data on *DSM–IV* disorders through clinician ratings on a 7-point severity scale (0 = *no features*, 1–3 = *subclinical*, 4–6 *marked to very severe*), and has been used to validate novel clinical assessment measures in previous research (e.g., Hawes et al., 2020). An updated *DSM–5* version of the DISCAP was used to index severity of diagnostic symptoms in the current study, with Kappa values indicating high levels of interrater reliability between blind independent raters regarding primary diagnoses of internalizing and externalizing disorders ($\varkappa = 1.0$), and secondary diagnoses of these disorders ($\varkappa = .87$).

The Depression Anxiety and Stress Scales 21 (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report measure of adult depression, anxiety, and stress, commonly used for research and clinical purposes. Extensive psychometric research has shown strong internal consistency across the three subscales (e.g., $\alpha = .82–90$; Henry & Crawford, 2005). Internal consistency was likewise strong in the current sample (depression: $\alpha = .92$; anxiety: $\alpha = 79$; stress: $\alpha = .83$).

The Maltreatment Index (MI), based on the Maltreatment Classification System by Barnett et al. (1993), indexes a child's exposure to various forms of abuse using researcher/clinician ratings of evidence collected from multiple informants/sources (e.g., parents, teachers, referral agencies, the individual child). The rater uses a 4-point Likert scale (1 = *never*; 2 = *a little bit*; 3 = *a fair bit*; 4 = *all the time*) to indicate the veracity of three statements pertaining to emotional abuse, physical abuse, and neglect, respectively. The MI was rated by clinicians as part of a comprehensive multi-informant assessment of referred children pretreat-

ment, and overall MI scores were produced by taking the highest score of all available reports for physical abuse, emotional abuse, and neglect. Associations between scores on the MI and theoretically related constructs have been demonstrated in previous research with clinical samples of children with conduct problems (e.g., Dadds et al., 2018).

The Global Family Environment Scale (GFES; Rey et al., 1997) indexes the overall quality of the environment in which a child has been raised. Raters use a hypothetical continuum from 1 (e.g., severe abuse, deprivation) to 90 (e.g., stable, secure, nurturing), based on all sources of available evidence about the family, and formulate a single score reflecting the lowest quality of family environment to which the child has been exposed during a substantial period (at least 1 year). Higher scores reflect a higher quality environment. Support for the reliability and validity of the scale has been demonstrated in a wide range of populations, including Australia (Rey et al., 2000).

Data Collection

All measures were completed at a single time point during pretreatment assessment, and a subset of 127 parents completed the ALES again at posttreatment, approximately 10 weeks later. Parent and teacher report measures were completed online by participants on their own electronic devices. Clinician-rated measures, including diagnostic interviews, were completed with parents in a 90 min face-to-face initial assessment session at the clinic.

Analytic Strategy

Missing data did not exceed 5% across items of all questionnaire measures, with the exception of item 20 on the ALES (6% missing). Diagnostic data (*DSM–5* externalizing, internalizing) were analyzed only in the subset of 153 children for which they were available as part of the child's clinical assessment. Associations between mother and father reports of child ACEs were examined using ICC. Hypothesis 1 was tested using bivariate (Pearson) correlations to examine direct associations between ALES Child Total scores and interview-based measures of child maltreatment and quality of the family environment. Hypothesis 2 was likewise tested using correlations between ALES Child Total scores and ratings of child symptoms by parents and teachers (SDQ Total Difficulties) and clinicians (*DSM–5* externalizing; internalizing). For Hypothesis 3, correlations between ALES Caregiver Total scores and DASS subscales were calculated. Hypothesis 4, regarding unique associations between ACEs within specific age-based periods and current child and parent symptoms, was again tested in separate analyses of data on child and parent ACEs, respectively. Unique associations between child ACEs and current psychopathology were examined in four regression models with the respective DVs of parent-reported SDQ Total Difficulties; teacher-reported SDQ Total Difficulties; clinician-rated externalizing symptoms; and clinician-rated internalizing symptoms. Due to the smaller size of this sample relative to the community sample data from boys and girls were pooled in these analyses and sex included as a covariate. Each model comprised the same covariates/IVs, entered in two blocks: chronicity of ACEs, child age, and sex (Block 1); numbers of child ACEs at age 0–1 year; age 2–3 years; age 4–5 years; age 6–8 years; and age 9–12 years (Block 2). Hypothesis 4 was then tested using data on caregiver ACEs. Unique associations between caregiver ACEs and DASS scores for depression, anxiety, and stress (DVs) were tested in linear regression models for mothers and fathers, respectively (six models total). Covariates and IVs were entered in three blocks: parent age, chronicity of ACEs (Block1); number of caregiver ACEs in infancy (age 0–1 year); childhood (age 2–12 years); adolescence (Block 2); and number of ALES risk factors endorsed by the caregiver during adult life (Block 3). Finally, hypothesis five regarding test–retest reliability was tested using ICC.

Results

Reliability

Among the subset of (n = 127) parents in the clinical sample who completed the ALES both at Time 1 and Time 2 (approximately 10 weeks apart), acceptable test–retest reliability was seen both for ALES Child Total (ICC = .84) and ALES Caregiver Total (ICC = .87). Among children whose mothers and fathers both attended the clinic, strong correlations were seen between mother and father scores on total child ACEs (ICC = .79), indicating acceptable interrater reliability for caregiver reports on the ACEs of their children.

Convergent Validity

Total number of child ACEs endorsed by parents on the ALES was significantly correlated with the clinician-rated MI, $r = .26$, $p < .01$, such that a higher number of child ACEs was positively associated with the child's exposure to more forms of maltreatment. Total number of child ACEs likewise significantly correlated with the clinician-rated GFES, $r = -.39$, $p < .01$, such that a higher number of child ACEs was negatively associated with the overall quality of the family environment. These significant associations can be seen to support the convergent validity of the ALES.

Criterion Validity

At the bivariate level, parent-reported SDQ Total Difficulties were significantly associated with ALES Child Total, $r = .39$, $p < .001$, number of ACEs within the age categories of 2–3 years, $r = .16$, $p < .05$; 4–5 years, $r = .34$, $p < .001$; and 6–8 years, $r = .32$, $p < .001$; and 9–12 years, $r = .15$, $p < .05$; and chronicity of ACEs, $r = .26$,

$p < .01$. Teacher-reported SDQ Total Difficulties were significantly associated with number ACEs within the ALES age category of 6–8 years, $r = .20$, $p < .01$. Clinician-ratings of diagnostic severity of *DSM–5* externalizing disorder symptoms were associated with ALES Child Total, $r = .27$, $p < .001$, and number of ACEs within the age categories of 4–5 years, $r = .25$, $p < .01$; 6–8 years, $r = .30$, $p < .001$; 9–12 years, $r = .25$, $p < .01$; and chronicity of ACEs, $r = .26$, $p < .01$. Diagnostic severity of *DSM–5* internalizing disorder symptoms were associated with ALES Caregiver Total, $r = .25$, $p < .01$ only, which itself was not associated with other child symptoms.

Results for the four regression models used to test Hypothesis 4 in relation to child ACEs, as outlined in the Analytic Strategy section, are as follows (for coefficients see Table 3). Coefficients for these models are reported in Table 3. Parent-reported SDQ Total Difficulties were predicted by chronicity of ACEs in Block 1 ($\beta = .18$, $p < .05$), while the only main effect in the full model was for number of ACEs at age 4–5 years ($\beta = .29$, $p < .01$). Teacher-reported SDQ Total Difficulties were predicted by child age in Block 1 ($\beta = .24$, $p < .01$), while the full model comprised main effects for child sex ($\beta = .16$, $p < .05$) and number of ACEs at age 6–8 years ($\beta = .25$, $p < .05$). Clinician-rated externalizing symptoms were predicted by chronicity of ACEs in Block 1 ($\beta = .18$, $p < .05$), while the full model comprised main effects for child sex ($\beta = .27$, $p < .01$), number of ACEs at 4–5 years ($\beta = .20$, $p < .05$), and number of ACEs at 9–12 years ($\beta = .19$, $p < .05$). The model for clinician-rated internalizing symptoms included no significant main effects.

With regard to associations between caregiver ACEs and DASS scores at the bivariate level, ALES Caregiver Total was positively associated with fathers' depression, $r = .17$, $p < .05$; anxiety, $r = .28$, $p < .01$; and stress, $r = .24$, $p < .01$. For mothers, bivariate associations were limited to those between caregiver ACEs during adolescence and DASS stress, $r = .16$, $p < .05$, and between caregiver ALES risk factors during adulthood and DASS stress, $r = .16$, $p < .05$ and depression, $r = .17$, $p < .05$. Results for the six regression models used to test Hypothesis 4 in relation to parent ACEs, as outlined in the Analytic Strategy section, are as follows. For fathers, depression was predicted by chronicity of ACEs in Block 1 ($\beta = .21$, $p < .05$). Anxiety was predicted by chronicity of ACEs in Block 1 ($\beta = .20$, $p < .05$), and remained significant in Block 2, where ACEs at age 0–1 was also significant ($\beta = .34$, $p < .01$). Stress was predicted by chronicity of ACEs in Block 1 ($\beta = .26$, $p < .05$), whereas only ACEs at age 0–1 was significant in Block 2 ($\beta = .27$, $p < .05$). No other main effects were seen in these models. For mothers, current stress was predicted by number of caregiver ACEs in adolescence ($\beta = .26$, $p < .05$). No other main effects were seen in this model, or in the models for mothers' depression or anxiety.

General Discussion

Despite mounting evidence that the developmental timing of ACEs plays a critical role in trajectories of mental health, methods for the efficient assessment of such timing in research and clinical settings have been lacking. The current research provides psychometric evidence in support of the reliability and validity of a brief caregiver questionnaire for this purpose. Ratings on the ALES pertaining to total numbers of ACEs as well as the chronicity of these ACEs in the lives of caregivers and their children were each found to be associated with current symptoms of psychopathology, consistent with the considerable evidence that these dimensions of ACEs both contribute to poor mental health (Thompson et al., 2015). Importantly, however, we also found that the

Table 3
ALES Indices of Child ACEs as Predictors of Parent, Teacher, and Clinician-Rated Child Psychopathology in Clinic-Referred Families (N = 168)

	Overall symptoms (SDQ Total Difficulties)						Diagnostic Interview Symptom Severity					
	Parent report			Teacher report			Externalizing			Internalizing		
Predictor variable	B	*SE*	β	B	*SE*	β	B	*SE*	β	B	*SE*	β
Block 1												
Child age	0.40	0.34	0.11	0.66	0.51	0.13	0.13	0.16	0.07	0.01	0.14	0.01
Child sex	0.60	1.09	0.04	3.53	1.64	0.16*	1.99	0.53	0.27**	−0.49	0.48	−0.08
Chronicity of ACEs	−1.22	0.79	−0.18	−2.31	1.19	−0.24	−0.15	0.39	−0.05	−0.00	0.36	0.00
Block 2												
ACEs 0–1 year	0.76	0.53	0.12	−0.51	0.80	−0.05	0.17	0.25	0.06	−0.06	0.22	−0.02
ACEs 2–3 years	−0.01	0.53	0.00	−0.09	0.79	−0.01	−0.38	0.25	−0.14	−0.05	0.22	−0.02
ACEs 4–5 years	1.17	0.40	0.29**	0.65	0.60	0.11	0.41	0.20	0.20*	0.26	0.18	0.16
ACEs 6–8 years	0.80	0.41	0.20	1.39	0.62	0.25*	0.38	0.20	0.19	−0.10	0.18	−0.06
ACEs 9–12 years	1.77	1.10	0.12	0.68	1.66	0.03	1.31	0.52	0.19*	0.36	0.47	0.06

Note. ACEs = adverse childhood experiences; SDQ = Strengths and Difficulties Questionnaire.
* $p < .05$. ** $p < .01$.

number of ACEs within specific age-based periods indexed by the ALES explained variance in these outcomes above and beyond overall chronicity of ACEs. Indeed, ACEs during a number of distinct age periods explained unique variance in the same current symptoms independent of one another. It is noteworthy that ALES indices based on chronicity of exposure, and number of ACEs within specific age periods, were somewhat less robustly associated with child psychopathology than were total scores on the ALES. Given that total scores on the ALES are likely to reflect both number and chronicity of ACEs, this is perhaps not surprising. It is also noteworthy that the specific age periods that were implicated in these associations varied somewhat across symptom type. For example, in Study 1, ACEs within almost every child age category except infancy contributed uniquely to the prediction of parents' reports of the child's overall symptoms, whereas ACEs during infancy (age 0–1 year) predicted current symptoms of PTSD only. This pattern was largely replicated for boys and girls. Such findings provide compelling evidence that the ALES captured developmentally specific information about ACEs of importance to subsequent mental health, beyond global indices regarding the number and duration of adversities.

With regard to the validation of caregivers' reports of the developmental timing of ACEs in their own lives, a particularly rigorous approach was used whereby caregivers' reports of current adversities in their adult lives were included as covariates when testing for infant, childhood, and adolescent ACEs as predictors of current psychopathology. Despite significant overlap between levels of adversity in parents' lives at the time of testing and their reports of ACEs during earlier life periods, and between current adversity and current psychopathology, ACEs within distinct childhood and adolescent periods explained unique variance in this psychopathology. Interestingly, while overall ACEs were associated with current psychological distress among both mothers and fathers, associations varied somewhat between mothers and fathers with regard to the ages at which ACEs predicted this adult distress. For example, middle-childhood ACEs were uniquely associated with distress among mothers in the community sample, while distress among fathers was uniquely predicted by ACEs during adolescence. There is considerable evidence that trauma pathways to adult mental health are to some extent sex-specific (Cavanaugh et al., 2015). Childhood adversity is understood to impact on adult psychopathology (e.g., PTSD, depression) in part through effects on biological domains, and there is emerging evidence that for some domains (e.g., HPA axis regulation, corticolimbic system, and epigenetics) these effects are moderated by sex (Tiwari & Gonzalez, 2018). Less, however, is known about the implications of developmental timing for sex-specific effects of this kind. Although the current research was not designed to examine mechanisms that may account for sex differences, the ALES has the potential to contribute to future research into how sex may further interact with the developmental timing of exposure to confer risk differentially to males and females over time.

A particularly novel aspect of the ALES is its two-generation structure, comprising parallel ratings of ACEs in the lives of children and their caregivers. This allows data about children and their parents to be collected simultaneously on the same standardized measure. The results of Study 2 can be seen to highlight the potential value of this structure. Here, clinician ratings of children's externalizing symptoms were significantly associated with the ACEs reportedly experienced by those children in distinct developmental periods (age 4–5 years; age 9–12 years), while internalizing symptoms were not. Interestingly, however, parents' reports of their own ACEs were significantly associated with clinician ratings of child internalizing symptoms, but not externalizing symptoms. As such, had assessment been limited only to the child's ACEs it may have given the appearance that these internalizing symptoms were unrelated to adversity, despite an apparent association with adversity in the previous generation. It was somewhat surprising that externalizing symptoms were not also associated with parental ACEs. However, based on the small effect sizes previously reported for associations between externalizing symptoms and parental ACEs (e.g., Cooke et al., 2019) we may have only detected them with a larger sample.

The use of clinician-rated measures of maltreatment and quality of family environment to validate ratings of child ACEs in Study 2 was also highly novel, and noteworthy given the range of adversities that are operationalized in the ALES beyond those of the original ACEs inventory (Felitti et al., 1998). The associations found between the ALES and interview-based measures of maltreatment and quality of family environment, while not strong in size, were consistent with conceptualizations of the overlap between these constructs. For example, among the seven categories of adversity represented by the original ACEs items, only three relate to maltreatment, while the other four relate to broader environmental adversity and household dysfunction (Felitti et al., 1998). It is understandable that quality of family environment showed a relatively stronger association with the ALES, as it incorporates a considerably broader range of adversities than the construct of maltreatment (e.g., child abuse and neglect, interparental conflict, frequent changes of residence, short-term parental figures) and has comparatively greater overlap with the construct of ACEs accordingly. These associations therefore add to the support for the validity of the ALES.

The current findings should be considered in light of some noteworthy limitations. First, our approach to validating caregiver ratings of the developmental timing of their own ACEs and those of their children focused on

the number of ACEs within specific periods. Our results therefore do not reflect whether the same or different ACE risk factors were occurring across these periods, which itself may have potential implications for various ACEs and outcomes. While beyond the scope of the current article, it would be beneficial to analyze this in future research. Second, while a key consideration in the development of the ALES was to expand on the types of adversities typically included in measures of ACEs, it does not include some experiences that evidence suggests should be considered ACEs (e.g., spanking; Afifi et al., 2017; Merrick et al., 2017) It will only be possible to specify a definitive set of such experiences once consensus is reached regarding those that qualify as ACEs. Future versions of the ALES incorporating additional risk factors may potentially explain additional variance in mental health outcomes. Third, this research was primarily concerned with developing a measure for caregivers to report on adversities experienced by their children due to the lack of such measures to date (Oh et al., 2018). Accordingly, data collection regarding caregivers' own adversities and symptoms was somewhat less extensive than that focused on child variables, which included multi-informant ratings and diagnostic interviews. The collection of additional data on parent psychopathology may have potentially identified additional associations with the ALES. Fourth, the lack of a longitudinal design meant that it was not possible to determine whether the associations between ALES indices of developmental timing and subsequent child outcomes were consistent with those that may be seen in data collected prospectively across childhood. Fifth, we note that unlike some measures that provide data on the number of caregivers involved in adverse experiences or ask about experiences with particular caregivers (e.g., mothers and fathers), respectively (e.g., Bifulco et al., 2005), the ALES refers to caregivers in general. Scores therefore do not provide information about who exactly was involved in these experiences, meaning that additional assessment may be required if such details are needed. Finally, we note that although the child component of the ALES indexes both past and current adversities that may be ongoing for a child, the caregiver component is by nature retrospective and therefore characterized by the limitations associated with all measures that rely on retrospective recall. It was not feasible to collect more extensive data on ACEs, such as would be provided by lengthy interviews focused exclusively on adversity, but we recommend doing so where possible in future research. It should be noted nonetheless that ACEs indexed using the 10 ALES items based directly on the original ACEs inventory correlated very highly with ACEs indexed by the full ALES measure in our sample.

Applications of the ALES in Research and Clinical Practice

In the translational research clinic in which the ALES was developed it has recently been used by our team in a trial designed to examine if methylation (epigenetic) status on the major neurodevelopmental genes of dopamine, oxytocin, serotonin, and cortisol, changes from pre- to posttreatment in children with conduct problems. These aims necessitated the measurement of type and timing of children's exposure to adversity, as well as caregivers' exposure to adversity, among families currently undergoing treatment. We have found the brief and user-friendly format of the ALES to be well-suited to the practical constraints of this context, where high quality research data are essential, but lengthy interviews are not possible due to other demands on participants and project personnel.

The ALES currently also serves multiple clinical functions in this setting, informing case formulation and treatment planning with referred families, while also providing a means to screen for family risk issues that may not always be identified during referral, telephone intake procedures, or face-to-face interviews with parents. Here, mothers and fathers independently complete separate copies of the ALES online, along with other routine clinical questionnaires, following an initial face-to-face clinical interview. Once the initial assessment is complete, new cases are discussed during case review meetings with the clinical team, and the ALES is built into the format of these presentations. Feedback of assessment results to parents is also routine and serves as a basis for collaborative treatment planning.

Conclusions

Recognition of the need to better understand and act on ACEs at levels of policy and practice have grown considerably in recent years, and it appears likely that researchers and clinicians will accordingly face a growing need to collect reliable and valid data on ACEs, including the precise points in development at which they occur. We found preliminary support for the reliability and validity of the ALES for this purpose, across both representative community and clinical samples. Moreover, despite the sensitive and confronting nature of the contents of the ALES, caregivers found the measure to be highly acceptable regardless of the number of ACEs that they were required to reflect upon while completing it. Further research into the properties of the ALES in additional populations is nonetheless needed and stands to inform emerging evidence regarding the importance of ACEs and their timing to mental health and other outcomes.

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Received March 3, 2020
Revision received September 16, 2020
Accepted September 26, 2020 ■