



Validation of a culturally adapted developmental screening tool for Australian Aboriginal children: Early findings and next steps

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ABSTRACT

Background: Early detection of developmental problems is important for facilitating access to targeted intervention and maximising its positive effects. The later problems are identified, the more likely that they will become increasingly difficult to ameliorate. Standardised developmental screening tools are known to improve detection rates of developmental problems compared to clinical judgement alone and are widely recommended for use with all children. The Ages and Stages Questionnaire (ASQ-3) is a tool that is widely used in Australia. However, mainstream screening tools may not be appropriate for remote-dwelling Australian Aboriginal children. While Australian Aboriginal children face multiple developmental risk factors, there are no developmental screening tools that have been validated for use in this population.

Aims: To determine the concurrent validity of the culturally adapted ASQ-3 – the ASQ-TRAK – for Australian Aboriginal children compared to the Bayley Scales of Infant and Toddler Development (Bayley-III), a standardised, professionally administered developmental assessment.

Subjects: The ASQ-TRAK and Bayley-III were administered cross-sectionally to 67 Central Australian Aboriginal children between 2 and 36 months of age.

Results: The ASQ-TRAK communication, gross motor, fine motor and problem-solving domains and the corresponding domains on the Bayley-III were moderately correlated. Overall sensitivity for the ASQ-TRAK was 71% (95% CI 29–96) and specificity was 92% (95% CI 88–99). Percentage agreement between the ASQ-TRAK and the Bayley-III was 90%.

Conclusions: The ASQ-TRAK shows promise as a tool that can be used to improve developmental monitoring for remote dwelling Australian Aboriginal children. Further research is necessary to build on the current findings.

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1. Introduction

There is substantial evidence that early identification of developmental delay and targeted early childhood intervention can significantly impact a child's health and well-being, with enduring positive effects up to decades later [1–3]. In contrast, the later problems are identified, the more likely they will escalate and become increasingly difficult to ameliorate over time [4]. Despite considerable evidence supporting early identification and intervention, screening for developmental difficulties remains problematic and delays often remain undetected until children enter school [5,6].

While developmental status can be assessed by clinical assessment or by using standardised developmental assessment tools, these require

specialised training and are relatively time-consuming and costly [7,8]. Parent-completed developmental screening tools, designed to identify children who might be at high risk of developmental delay and who require further evaluation, are one alternative. Structured developmental screening tools are known to improve detection of developmental delay compared to clinical judgement alone [4] and are widely recommended for use with all children, including in low- and middle-income countries and Aboriginal contexts [3,9,10]. However, a suitable tool is not always available for all contexts.

In Australia, remote dwelling Aboriginal¹ children are among the most disadvantaged, with significantly poorer health and education outcomes than their non-Aboriginal peers [11,12]. For Aboriginal children living in remote and very remote areas in the Northern Territory (NT) of Australia, over 50% of 5 year olds were identified as developmentally vulnerable in two or more domains [13]. In view of the

Abbreviations: ASQ-3, Ages and Stages Questionnaire – third edition; Bayley-III, Bayley Scales of Infant and Toddler Development – third edition; ASQ-TRAK, Ages and Stages Questionnaire – Aboriginal adaptation.

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¹ The terms Aboriginal and Indigenous are both used as alternatives to refer collectively to people who identify as being of Aboriginal and/or Torres Strait Islander descent. Throughout this article the term Aboriginal will be used with this inclusive reference.

multiple developmental risk factors Australian Aboriginal children face [14,15], the need for developmental screening in this population is all the more crucial. However, there are currently no developmental screening instruments validated for use in the Australian Aboriginal context [16]. The use of culturally inappropriate tools can lead to unreliable results with serious negative consequences, such as over- and under-recognition of children with developmental difficulties, services introduced too late or not at all, and undermining Aboriginal language and cultural goals [17,18].

Recently, a cultural and linguistic adaptation of the Ages and Stages Questionnaire, 3rd edition (ASQ-3) [19] was developed for use in the remote Australian Aboriginal context [20]. The ASQ-3 is one of the most widely used developmental screening tools and it has been culturally adapted and/or translated for use in many international settings [7, 21–28]. The Australian Aboriginal adaptation of the ASQ-3 – the ASQ-TRAK – is shorter, written in modified English, and includes modifications to make items more culturally appropriate for Aboriginal children. The ASQ-TRAK includes a set of colour-illustrated flipcharts and is designed to be administered by interview, encouraging the caregiver and child to engage with and demonstrate each item. The ASQ-TRAK has high face validity and was culturally acceptable and relevant to Aboriginal parents, Aboriginal Health Workers and early childhood development experts [20]. However, the psychometric properties of the ASQ-TRAK cannot be assumed to be equivalent to the ASQ-3 and a rigorous validity and reliability study is required in order to use the ASQ-TRAK with confidence.

One common method of assessing the validity of a screening tool is to compare children's performance on the screening tool with results on a standardised, professionally administered developmental assessment (concurrent validity). The most widely used measure in validation studies of the ASQ-3 is the Bayley Scales of Infant and Toddler Development, 3rd edition (Bayley-III) [29]. The Bayley-III is designed for children aged 16 days to 42 months and covers a set of domains that overlap with those of the ASQ-3, including problem-solving, communication, gross motor and fine motor subscales. The classification of children on the ASQ-3 and the Bayley-III (i.e. delayed vs not delayed) can be examined, while also exploring agreement for the corresponding domains on each instrument [30]. Previous studies that have compared the ASQ-3 to the Bayley-III have yielded sensitivity rates between 20% and 100% and specificity rates between 65% and 97%, although these vary by child age, cutoffs for defining delay, and for samples at high-risk of developmental delay [30–34].

The aim of this study is to investigate the concurrent validity of the ASQ-TRAK when compared to the Bayley-III for Australian Aboriginal children.

2. Methods

2.1. Context

The study was conducted at the Central Australian Aboriginal Congress (Congress), the Aboriginal community controlled primary health care service in Alice Springs. Alice Springs is the regional hub for Central Australia in the Northern Territory (NT). It has a population of 25,000 and approximately 20% identify as Aboriginal and/or Torres Strait Islander [35], although Congress data reveals a resident Aboriginal population of >9000 (J. Boffa, personal communication, 11 May 2016). Alice Springs' residents include Aboriginal people from all over Central Australia and beyond, in addition to its traditional owners, the Arrernte people. Multiple Aboriginal languages from the surrounding regions are spoken, in addition to Aboriginal English and standard Australian English. Aboriginal people reside in the suburbs and nineteen surrounding living areas or "town camps" (special purpose government leases), while others visit Alice Springs from remote communities or small family outstations.

2.2. Participants

Participants were 67 Aboriginal children who were current patients of Congress. Additional criteria included the child residing within the town boundaries during study participation and being within the eligible age range for one of six of the ASQ-TRAK questionnaires (2, 6, 12, 18, 24 and 36 months). We attempted to over-sample children with known developmental difficulties, in order to reduce the sample size required for sensitivity and specificity calculations [36]. Contact attempts and participation rates are summarised in Fig. 1.

2.3. Measures

2.3.1. ASQ-TRAK

The Ages and Stages Questionnaire, 3rd edition (ASQ-3) [19] is a developmental screening tool that has been validated in a large, diverse standardisation sample in the United States and has been found to have acceptable psychometric properties. The ASQ-3 consists of 21 questionnaires, for children from 1 month to 66 months of age. Each questionnaire contains 30 items organised into five areas: communication, gross motor, fine motor, problem solving, and personal-social. The ASQ-3 was carefully studied and adapted for use in Aboriginal communities, to develop the ASQ-TRAK [20]. Seven questionnaires – the 2, 6, 12, 18, 24, 36, and 48 month – were selected for adaptation. These ages aligned with the routine well-child checks requiring developmental checks in the NT, as part of the Healthy Under 5 Kids (HU5Ks) program at the time [16]. Children were eligible for a period of time either side of the target age, e.g. between 1 month 0 days and 2 months 30 days for the 2 month questionnaire.

2.3.2. Bayley-III

The Bayley Scales of Infant and Toddler Development, 3rd edition (Bayley-III) [29] is the most widely used standardised psychometric test to assess infant development. It is designed to be administered by a trained professional in order to measure the developmental status of children aged 1 to 42 months. The Bayley-III contains cognitive (91 items), receptive and expressive language (97 items), fine and gross motor (138 items), social-emotional (35 items), and adaptive behaviour scales (241 items). Only the first three scales were included for analysis in the present study.

2.4. Procedure

We aimed to recruit 120 participants (20 in each of the six age groups) over a period of approximately 28 weeks, with alternating weeks dedicated to either recruiting participants or conducting

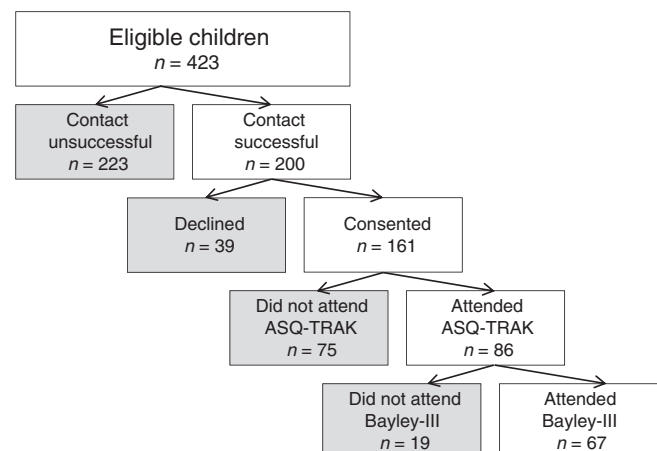


Fig. 1. Contact attempts and participation rates.

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