

Running head: COMMUNITY SCREENING FOR PRESCHOOL INHIBITION

Community screening for preschool child inhibition to offer the ‘*Cool Little Kids*’ anxiety prevention program.

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## Abstract

Temperamental inhibition has been identified as a key risk factor for childhood anxiety and internalising problems. An efficacious early prevention program for shy/inhibited children has been developed, however accurate, efficient and acceptable screening is needed to support wider implementation. We explore community screening options in the context of a trial implementing the *Cool Little Kids* prevention program for anxiety disorders. In comparison to the Australian Temperament Project's inhibition scale, we examine the Strengths and Difficulties Questionnaire's (SDQ) ability to screen for inhibited preschool children. Parents of 6,307 children aged 3 to 6 years enrolled in preschool programs from eight socio-economically diverse districts in Melbourne, Australia, first completed the measures of inhibition and SDQ. Parents with inhibited children then enrolled in the *Cool Little Kids* randomised trial (n=545). Of these, 88% provided feedback about inhibition screening. Parents allocated to the intervention also provided feedback on the *Cool Little Kids* parenting program. Results demonstrated that parents of preschool children (a) find inhibition screening acceptable, (b) take up this parenting program, and (c) report favourable feedback. The SDQ emotional symptoms subscale demonstrated acceptable sensitivity but insufficient specificity to identify inhibited preschool children. Presenting parents with a brief, validated inhibition scale could be a low-cost option for identifying inhibited preschool children in the community to offer early anxiety prevention.

**Key words:** preschool child, temperamental inhibition, anxiety, prevention

The World Health Organisation predicts that by 2030 internalising problems (e.g., depression and anxiety) will be second only to HIV/AIDS in international burden of disease (Mathers & Loncar, 2006). Internalising problems affect 1 in 7 school aged children (Sawyer et al., 2000), impacting on peer relations, school engagement, and later mental health, relationships and employment (Kessler et al., 2007; Mrazek & Haggerty, 1994). Socioemotional problems affect approximately 15% of toddler-preschool age children, and internalising difficulties show stability across early to mid childhood (Bayer, Hastings, Sanson, Ukoumunne, & Rubin, 2010; Bayer, Hiscock, Ukoumunne, Price & Wake, 2008; Bufferd, Dougherty, Carlson, Rose & Klein, 2012). Few children with emotional or behavioural problems receive treatment services (Ford, 2008). Sawyer and colleagues' (2000) population study reported that for children age 4-17 years only 25% with clinical and 12% with subthreshold symptoms accessed any professional service. Pavuluri, Luk and McGee (1996) found that amongst preschool children with clinical problems, less than half of parents recognised behavioural issues in their child and fewer than 20% accessed professional services. Development of early childhood prevention for internalising problems is in its infancy (Bayer et al., 2011).

Temperamental inhibition has been identified as the largest single risk factor for developing childhood anxiety disorders and internalising problems (Biederman et al., 2001; Claus & Blackford, 2012; Hirshfeld-Becker et al., 2007; Muris, van Brakel, Arntz, & Schouten, 2011; Prior, Smart, Sanson & Oberklaid, 2000; Rapee, Schniering, & Hudson, 2009). Inhibition is a partly heritable trait that predisposes children to chronic avoidance or withdrawal from unfamiliar people and situations (Asendorpf, Dennison, & van Aken, 2008; Fox, Henderson, Rubin, Calkins, & Schmidt, 2001; Kagan, 1997; Kagan, Reznick, & Sniderman, 1987; Rothbart, Ellis & Posner, 2004).

Inhibited children are characterised by a reluctance to initiate and/or participate in social interactions when meeting new children or adults, a tendency to stay close to safety figures, and signs of distress when left alone in new situations. These distressed child behaviours have in turn been shown to elicit protective and controlling parenting interactions (Hudson, Doyle, & Gar, 2008; Kiel & Buss, 2011; Murray, Creswell & Cooper, 2009; Rubin, Nelson, Hastings, & Asendorpf, 1999). Given that child inhibition has been identified as the single strongest risk for the development of anxiety disorders, it makes sense that early prevention efforts should target this contributor. Screening for early inhibition could assist with parent recognition of their child's difficulties. Parent recognition of young children's behaviour as problematic is known to be an important step to facilitate professional help seeking (Pavuluri et al., 1996).

In a recent systematic review of early interventions to improve social, emotional, and behavioural outcomes, Bayer and colleagues (2009) identified *Cool Little Kids* as the only preschool age prevention program to successfully prevent anxiety disorders. In this review around 50 preventive interventions spanning children age 0-8 years evaluated in randomised trials were reviewed; most targeted behavioural problems with only a few targeting emotional problems. At preschool age there were 12 preventive interventions for socioemotional problems that included some measure of emotional outcome. However, only *Cool Little Kids* specifically aimed to prevent early internalising problems. This program targeted inhibited temperament as the strongest empirical risk factor.

In two university-based efficacy trials of *Cool Little Kids*, Rapee and colleagues utilised combined maternal report and laboratory observation to select parents with inhibited preschool age children for recruitment (Kennedy, Rapee, & Edwards, 2009;

Rapee et al., 2010). This preventive parenting group program aimed to reduce overprotection of inhibited young children. Overprotective parenting has been identified as a key risk factor for inhibited children developing anxiety disorders and internalising symptoms (Bayer, Sanson, & Hemphill, 2006; Bayer et al., 2011; Hirshfeld-Becker & Biederman, 2002; Rubin, Burgess, & Hastings, 2002).

Overprotective parenting is characterised by a tendency to allow avoidance of, and directly intervene in, potentially stressful situations, in an effort to prevent the child from becoming upset or frustrated. Such parenting interactions can undermine a child's competence and self-efficacy and reinforce perceptions of threat, thereby exacerbating difficulties with anxiety, peer relationships and school adjustment (Chorpita & Barlow, 1998; Coplan, Arbeau, & Armer, 2008; Wood, McLeod, Sigman, Hwang, & Chu, 2003). Rapee and colleagues' randomised trials demonstrated that delivering the *Cool Little Kids* parenting group program for inhibited preschool children successfully prevented the development of childhood anxiety disorders up to three years later (Kennedy et al., 2009; Rapee et al., 2010). An 11 year follow up study showed that some effects lasted into middle adolescence. Compared with controls, adolescent girls whose parents had been through this early intervention program showed significantly fewer internalising disorders, maternally reported anxiety symptoms and self-reported life interference (Rapee, 2013).

Rapee and colleagues' efficacy studies are the only trials that have attempted to detect inhibition in young children to offer effective early intervention. However, the inhibition detection procedure was time-intensive. Screening packets were first distributed to parents at preschool services, and those children scoring high on inhibition were invited into a university playroom for detailed laboratory assessment.

Children who also scored high on laboratory observed inhibition were eligible for Rapee's trials.

A new population-based trial of the *Cool Little Kids* parenting group program is currently underway for 2010-2014 (Current Controlled Trials ISRCTN 77531789; Bayer et al., 2010; Bayer et al., 2011). Initial data pertaining to inhibition screening options for large scale implementation are now available. In implementing a preventive protocol it is important to find an effective screening strategy, which is both acceptable to parents and able to accurately identify most at risk children (Hirshfeld-Becker & Biederman, 2002). In the current trial, a process was tested of enlisting preschool services to distribute screening questionnaires to parents of children enrolled in their year before starting school. The questionnaire included both the Australian Temperament Project's inhibition scale (a brief validated 7-item screen) and the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a standardised measure used in Australia as part of a comprehensive screen of children's health and wellbeing at school entry within the context of Victoria's Primary School Nursing Program (Department of Education and Early Childhood Development, 2013).

The SDQ was included in the screening process for our population-based trial as a potential existing school-entry measure to compare to the standard temperamental inhibition scale. Item content on the emotional symptoms subscale of the SDQ taps shy and fearful behaviours. A prior UK study with a community sample of 5 to 15 year olds indicated that the SDQ emotional subscale detected 73% of children with social phobia (Goodman, Ford, Simmons, Gatward & Meltzer, 2003). Taken together, the item content, demonstrated sensitivity to social phobia, and use in an existing screening system (Victoria's School Entrant Health Questionnaire) make the emotional symptoms

subscale of the SDQ a potentially useful proxy measure for screening inhibited behaviour.

The primary aim of this brief research paper is to report on and evaluate these inhibition screening options within the *Cool Little Kids* population-based trial. The inhibition questionnaire takes parents less than a minute to complete, which is highly efficient compared to Rapee's initial trials. We explore the extent to which parents (a) find inhibition screening acceptable and (b) take up the opportunity for this parenting program. The potential utility of the SDQ emotional symptoms subscale as a preschool inhibition screen is also explored.

## **Method**

### *Procedures*

Recruitment of participants was conducted over two years. In 2011, preschool services in four local government districts were invited to take part in the *Cool Little Kids* prevention trial. In 2012, this opportunity was extended to eight local government districts, including the original four. In both years, the government districts were chosen to span a range of socio-economic levels. All preschools listed as offering government-funded four-year-old programs in these districts were invited to take part. Uptake by preschool services in both years was high at 78%, with 133 of 170 eligible preschools taking part in 2011, and 298 of 380 eligible in 2012. Participating preschools distributed the screening questionnaire to all parents of children enrolled in their year before starting school (most commonly 4 years of age). In 2011, parents returned completed questionnaires to a confidential study box located at their preschool

(37% response rate from distributed questionnaires). In 2012, parents were provided a reply-paid envelope to return questionnaires more directly to the study team (34% response rate).

Parents received a confidential letter in the post to their residential address informing whether their child scored high on shyness/inhibition (see measures below). All parents of inhibited children were then invited to enrol in the *Cool Little Kids* randomised controlled trial. After informed consent was received by the study team, parents were either offered the parenting group program or continued to receive usual services in the community in the control arm. All parents enrolled in the trial were mailed the feedback questionnaire to report on the inhibition screening process (and intervention if in that arm). Feedback questionnaires were mailed either shortly after randomisation (control arm) or two weeks following the final parenting group session (intervention arm). All materials and procedures were approved by The Royal Children's Hospital Human Research Ethics Committee.

### *Participants*

In 2011-2012, 6,346 children attending 307 preschool services in their year before starting school were recruited across eight socio-economically diverse local government districts of metropolitan Melbourne, Australia. Of these, 6,307 children fell within the eligible age-range 3-6 years ( $M=4.5$ ,  $SD=0.38$ ). Girls represented 47% of the sample (3,359 boys, 2,948 girls). The children's birth-order was: 51% first-born, 34% second-born, 12% third, 4% fourth or later.

Screening questionnaires were predominantly completed by mothers as primary caregivers (94%) and most respondents were in partnered relationships (93%). Overall,

families spanned a broad range of socio-demographic characteristics. Mothers' ages ranged from 21 to 55 years ( $M=37.33$ ,  $SD=4.70$ ) while fathers' ranged from 21 to 67 years ( $M=39.55$ ,  $SD=5.43$ ). Parent education was also diverse including those who had not completed high school (8% mothers, 7% fathers), completed high school only (10% mothers, 7% fathers), completed a trade or certificate (26% mothers, 37% fathers), completed a tertiary degree (32% mothers, 26% fathers) and postgraduate degree (25% mothers, 23% fathers). The proportion of parents with postgraduate qualifications was higher than Australian census data for this age bracket (ABS, 2007: 7% females, 8% males). Consistently, the sample's socio-economic disadvantage level SEIFA ( $M=1045$ ,  $SD=46$ ) was slightly above the national average (ABS, 2011;  $M=1000$ ,  $SD=100$ ). The sample nevertheless included families across all social strata (SEIFA range 812-1131) with 17% facing financial hardship (as Health Care Card benefit recipients). Parents from a range of non-English speaking backgrounds were also represented (11%, compared with 32% census data, ABS, 2007), including those from African, Asian, European, and Middle-Eastern regions.

### *Measures*

*Temperamental inhibition* was measured with the Australian Temperament Project's inhibition scale (Sanson, Smart, Prior, Oberklaid & Pedlow, 1994). This measure includes seven statements describing social approach/withdrawal behaviours (e.g., 'My child is shy when first meeting new children') with six-point response scales ranging from 'almost never' to 'almost always'. This brief scale has demonstrated sound psychometric properties (Sanson, Pedlow, Cann, Prior, & Oberklaid, 1996).

Following prior research (Rapee et al., 2005, 2010), children scoring above 30 were considered high on inhibition and eligible for the trial.

*The Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997; 2001) is an internationally utilised brief screening tool for child and adolescent emotional and behavioural problems. The SDQ comprises 25 items in total, with five subscales: emotional symptoms, conduct problems, hyperactivity, peer problems, prosocial behaviour. The emotional symptoms subscale (the focus of the present research) includes five items, e.g., ‘many worries or often seems worried’. Parents indicate the extent to which each statement is true of their child, from ‘not true’ through ‘somewhat true’ to ‘certainly true’. Psychometric evaluations of the SDQ emotional symptoms scale tend to show moderate internal consistency and reasonable test-retest reliability (Hawes & Dadds, 2004; Mellor, 2004; Stone, Otten, Engels, Vermulst & Janssens, 2010). Studies of factor loadings support internal validity (Hawes & Dadds, 2004; Stone et al., 2010), and acceptable external validity has been demonstrated with inter-informant correlations, diagnostic interviews and other child behaviour questionnaires (Hawes & Dadds, 2004; Mellor, 2004; Theunissen, Vogels, de Wolff & Reijneveld, 2013).

*Acceptability of inhibition screening* was measured with three items in the parent feedback questionnaire developed for the current *Cool Little Kids* population-based trial. Parents were asked to indicate whether they found it ‘helpful’, ‘harmful’, or ‘neither’ to (a) receive a screening questionnaire for child shyness/inhibition distributed by their preschool service, (b) complete this screening questionnaire for their own child, and (c) receive a letter about their child’s shyness/inhibition result in the post.

*Parent evaluation of the Cool Little Kids parenting program* was measured with five items gauging how useful they found the program for (a) understanding young children's shyness, inhibition, and anxiety, (b) knowing what leads to anxiety in young children, (c) knowing how to encourage brave behaviour in their own child, (d) knowing how to reduce anxious behaviour in their own child, and (e) knowing how to change their anxious and fearful thoughts as parents. Responses were made on five-point scales ('not at all', 'a little', 'quite', 'very', 'extremely' useful).

## Results

Figure 1 presents a flowchart of the preschool uptake and parent response rates for the screening and feedback questionnaires. Across the eight districts, enrolment records of participating preschools indicated 17,661 children eligible for inhibition screening in the year before starting school. Of these, 6,346 parents returned a completed inhibition screening questionnaire for their child (36%). Eleven percent of children (n=703) scored above the cut-point as temperamentally inhibited and 78% of these (n=545) enrolled in the randomised controlled trial.

Of families with inhibited children enrolled in the trial, 88% returned their feedback questionnaire (n=480). As shown in Table 1, parents with inhibited children reported that they found the screening process helpful, especially when followed by the offer of assistance with the parenting program. Indeed, 87% of parents in the intervention arm said that having a screening questionnaire for child shyness sent home from preschool was helpful, compared with only 60% of parents in the control arm ( $\chi^2=44.28$ ,  $p<.001$ ). Parenting program uptake following the inhibition screen was reasonably positive with 80% of parents attending at least one *Cool Little Kids* group

session while 60% attended at least three (of six total) sessions. Children's level of inhibition on the screening questionnaire (above the eligibility cut-point) was a weak predictor of group attendance ( $r=.13$ ,  $p=.041$ ).

Parent feedback evaluations of the *Cool Little Kids* program delivered widely in the community were favourable. Eighty-seven percent of parents in the intervention arm returned feedback questionnaires ( $n=231$ ). Most parents (86%) reported that the parenting program had been 'quite' to 'extremely' useful for understanding their young child's shyness, inhibition and anxiety. Most parents (89%) also rated this program from 'quite' to 'extremely' useful for learning what leads to anxiety developing in young children. Almost all parents (91%) rated this parenting program from 'quite' to 'extremely' useful for both (a) encouraging brave behaviour of their child and (b) reducing anxious behaviour of their child. The majority of parents (80%) further reported that the *Cool Little Kids* parenting program had been 'quite' to 'extremely' useful for changing their own personal anxious and fearful thinking patterns. A final overall endorsement of *Cool Little Kids* was that 95% of parents said they would recommend this program to a friend.

The next analysis explored whether the SDQ could accurately identify inhibited preschool children. ROC analysis indicated the SDQ's emotional symptoms subscale had 'adequate' overall utility in determining true positives and true negatives against the Australian Temperament Project's inhibition scale ( $AUC = .82$ ,  $p < .001$ , 95% CI [.80,.83]). The most efficient cut-point to identify temperamentally inhibited children on the SDQ emotional symptoms scale was a score of three, providing sensitivity of .71 and specificity of .77. This cut-point meets the recommended sensitivity of .70 and approaches the recommended specificity of .80 (Matthey & Petrovski, 2002). The

SDQ's emotional symptoms 'borderline-abnormal' cut-point is four (<http://www.sdqinfo.org/py/sdqinfo/c0.py>). This score did not provide accurate screening for inhibition (sensitivity .55, specificity .87).

### **Discussion**

In the context of a population-based trial of *Cool Little Kids*, the present study aimed to assess whether parents of preschool children find inhibition screening acceptable, find this parenting program useful, and explore whether the SDQ could accurately screen for inhibition. This study found that wide-scale community-based screening for inhibition in preschool children is feasible. Preschools serving socio-economically diverse family populations in Melbourne Australia successfully supported inhibition screening via teachers distributing a brief questionnaire to all enrolments in the year before starting school. A third of all enrolments voluntarily completed inhibition screening for their child, even with no guarantee of intervention to follow. Parental feedback on this inhibition screening process was positive or neutral; especially positive when accompanied by the parenting group program. Parent feedback on the *Cool Little Kids* program was also highly positive. Parents reported this program was useful for understanding their child's inhibition, learning what contributes to anxiety problems, and knowing how to encourage brave behaviour and reduce anxious behaviour in their inhibited young child. Together, these findings from the larger randomised trial are supportive of implementing screening to identify and assist inhibited young children in the community setting.

This population-based study was the first to implement universal screening for inhibition via preschool services across the community prior to offering an early

intervention program. In Rapee's prior trials of *Cool Little Kids*, time and cost intensive laboratory observation protocols were used in the assessment of child inhibition (Rapee et al., 2005, 2010). The present study findings show it is feasible and acceptable to preschools and parents to widely implement a simple, parent-report inhibition screen for preschool children, substantively increasing the availability of professional help to families in need. Strengths of the present study are the population-based design capturing a wide socio-demographic range, and high uptake from preschools and parents enrolling in the program. Although a limitation is that not all eligible parents completed screening questionnaires, the demographic characteristics of the sample that did were representative of the Australian population.

Given inhibition is the single strongest predictor of childhood anxiety problems, it is in the interests of community child health to consider acceptable universal screening with timely access to early intervention. In this paper we considered a potential future option of government/school policy screening within a routine school entry questionnaire. An existing school-entry screening tool, the SDQ, was considered for its ability to facilitate efficient wide-scale inhibition screening. However, the emotional symptoms scale was not able to accurately identify inhibited children, compared to the Australian Temperament Project's well-validated and brief inhibition scale.

Potentially viable future screening options could involve early school services and maternal and child health services distributing the present study's inhibition scale to parents of preschool-age children. Administrative costs could be minimised by providing parents with simple self-score instructions or web-based administration/scoring. Parents who thereby identified their child as inhibited on this

brief valid scale could then contact a local clinician in their area to enrol in the *Cool Little Kids* parenting program. Preschool teachers could also be invited to complete this brief inhibition screen to compare with parents' views and support a consistent intervention approach across home and school settings.

In conclusion, temperamental inhibition is a key risk for child anxiety and internalising problems. *Cool Little Kids* is an efficacious parenting program that prevents anxiety disorders developing in inhibited preschool children. Community wide screening for inhibition in preschool services is feasible for teachers and acceptable and useful for parents. Presenting parents with a brief, validated inhibition scale to self-score could be a low cost option for identifying inhibited preschool children in the community and offering early intervention for anxiety and internalising problems.

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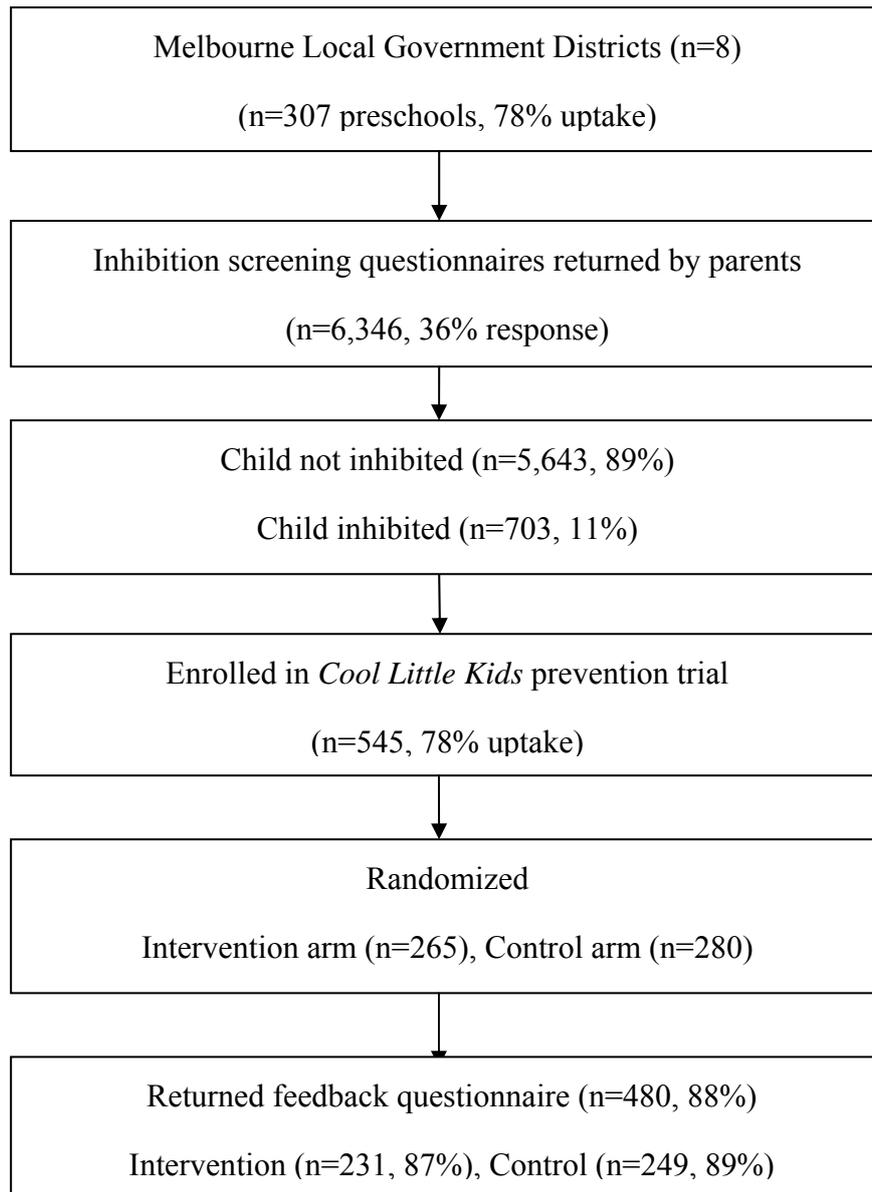
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Table 1. Parent feedback on screening in preschools for child inhibition

Feedback Questions	Intervention Group		Control Group	
	n	%	n	%
Having a screening questionnaire for child shyness sent home from the preschool was...(n=478)				
Helpful	201	87%	150	60%
Neither	28	12%	98	40%
Harmful	1	<1%	0	0%
Filling out the screening questionnaire was... (n=478)				
Helpful	187	81%	151	61%
Neither	42	18%	96	39%
Harmful	1	<1%	1	<1%
Receiving the letter in the post about whether my child was shy or not was... (n=474)				
Helpful	186	82%	145	59%
Neither	39	17%	98	40%
Harmful	3	1%	3	1%



*Figure 1.* Flowchart of participating preschools and parents of children in the year before starting school