



Modern Research in Child's Psychometric Tools

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Abstract

Child development theories focus on explaining how children change and grow over the course of childhood. Such theories center on various aspects of development including social, emotional, and cognitive growth. The aim of this study was study of modern research in child's psychometric tools "systematic Review". Number of 40 article published peer-reviewed English language research studies examining the psychometric properties, interpretability and feasibility of instrument measures of children were considered for inclusion in the review. Unpublished manuscripts, reviews, guidelines, commentaries and other descriptive articles were excluded. Published abstracts were also not included as the information provided in abstracts is limited and frequently non-peer reviewed. Studies published in languages other than English were also excluded due to time and financial constraints (translation costs). Finding shown that many tools have been developed to measure different child growth rates that this systematic review provides evidence of the psychometric properties and feasibility of commonly used instrument about child's measures. Results shown that for children under 2 years of age, few psychometric tools have been evaluated. Therefore, it is recommended that future researchers target tools made for children under 2 years of age.

Keywords: Modern research, Childs, Psychometric Tools, systematic Review.



Introduction

Child development theories focus on explaining how children change and grow over the course of childhood. Such theories center on various aspects of development including social, emotional, and cognitive growth. The study of human development is a rich and varied subject. We all have personal experience with development, but it is sometimes difficult to understand how and why people grow, learn, and act as they do. Why do children behave in certain ways? Is their behavior related to their age, family relationships, or individual temperaments? Developmental psychologists strive to answer such questions as well as to understand, explain, and predict behaviors that occur throughout the lifespan. In order to understand human development, a number of different theories of child development have arisen to explain various aspects of human growth (Cherry, 2020).

Theories of Development in Early Childhood

Early Childhood (In this module, early childhood is seen as covering zero to six years of age and comprises infancy (zero to one and half year), toddlerhood (one and half to three years) and preschool-age (three to six years); **Major Developments in Infancy** (Infancy comprises zero to one and half year of age, f. g. "Oral Stage Newman & Newman, 2009", "Development of Attachment Lesser & Pope, 2007" and "Sensorimotor Development Lesser & Pope, 2007"); **Major Developments in Toddlerhood** (Anal Stage Dale et al., 2006, Autonomy Lesser & Pope, 2007, Shame or Doubt Newman & Newman, 2009, Imitation Newman & Newman, 2009, Beginning of Self-Concept Lesser & Pope, 2007, Language Development Newman, 2009); **Major Developments in Preschool-Age** (Phallic Stage Robbins et al., 2006, Initiative Lesser & Pope, 2007, Guilt Izard, 1977, cited in Newman & Newman, 2009, Identification with Parents, Newman & Newman, 2009, Development of Self-Concept Lesser & Pope, 2007, Preoperational Cognitive Development Robbins et al., 2006, Development of Peer Relationships Lesser & Pope, 2007, Types of Play Sigelman & Rider, 2006, Pretend Play Lesser & Pope, 2007, Group Games Newman & Newman, 2009) (Desai, 2018).

Theories of Development in Middle Childhood

Major Developments in Middle Childhood (Psychosexual Latency Stage Robbins et al., 2006, "Industry Newman & Newman, 2009, Inferiority Newman & Newman, 2009, Education Newman & Newman, 2009", Development of Concrete Cognitive Operations Robbins et al., 2006, Development of Executive Functions Lesser & Pope, 2007, "Learning Disabilities Lesser & Pope, 2007", Development of Gender Identity Lesser & Pope, 2007, "Peers and Friendships Lesser & Pope, 2007, Team Play, Newman & Newman, 2009" (Desai, 2018). Many tools have been developed to measure different child growth rates (see table 1). In one study aimed to adapt the International Society for the Prevention of Child Abuse and Neglect child abuse self-report measure (parent and child) for use in intervention studies and to investigate the psychometric properties of this substantially modified tool in a South African sample. The resulting ICAST-Trial measures have 25 (adolescent) and 14 (caregiver) items respectively and measure physical, emotional and contact sexual abuse, neglect (both versions), and witnessing intimate partner violence and sexual harassment (adolescent version) (Meinck, Boyes, Cluver, Ward, Schmidt, DeStone, Dunne, 2018). Other study with aimed to evaluate the psychometric properties of the Brazilian version of health-related quality-of-life questionnaires of children with food allergy and their parents. Cronbach's alpha coefficients were 0.85 and 0.91, respectively, which showed good internal consistency of the tools. The intraclass correlation coefficients between test and retest were 0.87 and 0.84 for children and their parents, respectively, showing good reproducibility for both questionnaires. The correlation between the specific and the generic questionnaires was significant (Mendonça, Solé, DunnGalvin, Len, Sarni, 2019). One study assessed the utility of the Spence Children's Anxiety Scale - Parent Form (SCAS-P) across parents of children with (i) anxiety and (ii) Autism Spectrum Disorder (ASD). Analysis revealed different factor structures between the Anxious and ASD groups and evidence for measurement variance across groups in some parts of the SCAS-P (Toscano, Baillie, Lyneham, Kelly, Hudson, 2020).

To evaluate the reliability of the Ages and Stages Questionnaires (ASQ-3) 24 and 48 month intervals translated to Spanish by Brookes Publishing, and the agreement between both questionnaires,



comparing late preterm (LPI) and term-born infants (terms). Cronbach's alpha scores for the motor domains on both intervals were low, but acceptable compared with the overall score; a strong positive correlation between the domain and overall score were obtained in the majority of the domains. The correlation between the 24 and 48 month total scores were positive, especially for LPI (Schonhaut, Martinez-Nadal, Armijo, Demestre, 2019). Given the tremendous SEC gains made by preschoolers, early childhood educators need access to sensitive assessment tools that enable them to monitor and tailor instruction to individual children's needs. Computerized direct assessment tools have several advantages to meet these needs, including inherent interest to children and ease of use for teachers. Findings showed that the computerized AKT-S and CST appear reliable. Further, for concurrent validity, both are related to, and do not differ from, the in-person mode. Predictive validity relations were stronger for the AKT-S than the CST, therefore validity of the CST should be probed further (Denham, Bassett, Zinsser, Bradburn, Bailey, Shewark, Kianpour, 2020).

In other study investigated the psychometric properties of the Social Worries Anxiety Index for Young children (SWAIY), adapted from the Social Worries Questionnaire—Parent version (SWQ-P; Spence, 1995), as a measure of social anxiety in young children. The SWAIY demonstrated excellent (> 0.80) internal consistency and a one-factor model. Test-retest reliability was strong ($r = 0.87$) and evidence of convergent validity ($r > .50$) was found. The study provides initial evidence for the validation of SWAIY as a measure of social anxiety in children aged four to eight years old. This questionnaire is ideal for investigating social anxiety over early childhood and the relationship between early social worries and later anxiety disorders (Stuijzand & Dodd, 2017).

In one study the purpose is investigate adaptation, validity, and reliability of the Turkish version of the Child and Adolescent Social Support Scale for Healthy Behaviors (CASSS-HB). Psychometric analyses of the Turkish version of the CASSS-HB indicate high reliability and good content and construct validity. It can be seen that the items comprising the scale appear to be acceptably capable of measuring the variable of social support in terms of healthy behavior in children and adolescents. Healthcare professionals can thus use the scale for determining the degree of social support students of the ages 11–14 receive in terms of developing healthy behavior (Albayrak, Çakır, Kılınç, Vergili, Erdem, 2018).

In one between-subjects study, the psychometric properties of caregiver behavioral, academic, and emotional functioning ratings for youth between the ages of 5 and 18 representing a mixed clinical sample were compared across computer-based and paper-and-pencil administration formats. In terms of psychometric characteristics, no group differences were found on inter-item reliability for any measure, and inter-item reliability for all scales across groups fell within the acceptable range. Similarly, comparisons of factor loadings across groups indicate marked consistency in the psychometric structure of all measures across administration formats. These results suggest that, regardless of administration method, the psychometric properties of caregiver ratings of childrens' behavioral, academic, and emotional functioning remain consistent (Pritchard, Stephan, Zabel, Jacobson, 2017).

In other study assessed psychometric properties of a self-reported measure of posttraumatic stress disorder (PTSD) for adolescents based on DSM-5 criteria—the Child PTSD Symptom Scale—Self Report. tested the internal consistency, test-retest reliability, and convergent validity. Analyses revealed good to excellent internal consistencies, moderate to good agreement test-retest reliability, and good convergent validity. Results supported the use of the CPSS-SR-5 scale as a valid and reliable measure for the identification of PTSD symptoms and probable diagnosis according to DSM-5 criteria in Portuguese adolescents (Pinto, Correia-Santos, Castro, Jongenelen, Levendosky, Maia, 2019).

In one paper has been discussed about the short form of the Preoccupied and Avoidant Coping Questionnaire (PACQ; Younger, Corby, Perry, 2005) is a widely used self-report questionnaire measuring insecure attachment toward mother and father in middle childhood. However, its factorial structure has not yet been examined, and evidence concerning its concurrent and convergent validity is extremely sparse. Results supported the factorial validity of the PACQ, its satisfactory internal consistency and structural invariance across child gender. However, findings lent only partial support



to the association between the PACQ and the ECR-RC, and convergent and predictive validity were found only for the avoidance subscale of these questionnaires. Overall, the Italian version of the PACQ is a psychometrically sound instrument to assess insecure attachment in middle childhood (Marci, Moscardino, De Carli, Altoé, 2019).

In one systematic review sought to identify observational measures of parent–child interactions commonly implemented in parenting program research, and to assess the level of psychometric evidence available for their use with this age group. Results indicated that the majority of psychometric evidence related to children aged from birth the three with internal consistency, inter-rater reliability, and structural validity the most commonly reported properties, although this evidence was often weak. The findings suggest further validation of the included measures is required to establish acceptability for the whole target age group (Gridley, Blower, Dunn, Bywater, Whittaker, Bryant, 2019).

In the one study aimed to (i) validate the Child Food Rejection Scale in English and (ii) compare children’s food neophobia and pickiness in the UK and France. To that aim, the Child Food Rejection Scale was first translated into English and its reliability and validity were assessed. Second, food rejection scores in a UK sample and in a French sample were directly compared to examine cross-cultural differences. Results showed that the Child Food Rejection Scale can be successfully used outside France. Moreover results revealed that UK children are less neophobic and picky than French children. These cultural differences can be useful to inform targeted interventions to change food related behaviors in these different populations (Rioux, Lafraire, Picard, Blissett, 2019).

The objective of one study was to revise the PFS in response to feedback from practitioners, and analyze the internal structure of new items. Exploratory factor analyses yield a five-factor solution. Four of the factors consisting of Family Functioning and Resilience, Nurturing and Attachment, Social Supports, and Concrete Supports. A fifth factor emerged consisting of items intended to capture Social Supports. Adapted these items to measure Caregiver/Practitioner Relationship (Sprague-Jones, Counts, Rousseau, Firman, 2019).

The purpose of the one survey was to develop and validate an instrument to assess speech stimulability in Persian speaking children. The final version of the test includes 132 items (consonant and vowel singleton words and sentences). There was no significant difference among experts’ judgment in the content validity of the items ($P > 0.05$). All of the children could easily repeat the items in the pilot study. The participants were stimutable more than 80% for all of the consonants except/z/and 100% for the vowels in the items of the final version of the Persian test of speech stimulability. All of the reliability values (inter-rater reliability, test-retest, and internal consistency) were higher than 0.8. Investigation of psychometric properties of the Persian test of speech stimulability showed that this test is a valid and reliable scale to assess the speech stimulability in Persian speaking children.

The one study evaluated the psychometric properties of the Child Anxiety Life Interference Scale – Preschool Version (CALIS-PV). The CALIS-PV is a brief (18 item) parent-report measure of the impacts of a young child’s anxiety on their own life and that of her or his parent. Confirmatory factor analysis supported three CALIS-PV factors reflecting anxiety-related life interference at home, outside home and on parent life. The three factors showed good internal consistency and good convergent and divergent validity, and successfully differentiated children with and without an anxiety diagnosis. Findings provide initial support for the CALIS-PV as a reliable and valid measure of the daily life impacts of childhood anxiety for preschool-aged children and their parents (Gilbertson, Morgan, Rapee, Lyneham, Bayer, 2017).

The purpose of one study was to develop and assess the reliability and validity of the internalizing subscale on the interRAI Child and Youth Mental Health (ChYMH) in assessing broadband internalizing mental health symptoms. The internalizing subscale demonstrated strong measurement properties for a three-factor structure (i.e., depression, anxiety, anhedonia) and MIRT analyses showed individual items had acceptable discrimination parameters across the latent continuum. A series of four competing models using confirmatory factor analyses were conducted in a separate sample of 1397 children/youth assessed in 2017 and the bifactor model showed superior fit compared to other models.



Finally, concurrent validity of this measure was confirmed based on relationships with other established subscales from criterion measures (Lau, Stewart, Saklofske, Hirdes, 2019).

In one study the first psychometric assessment of the Chinese SPQ-C in Mainland China. Exploratory factor analysis and confirmatory factor analysis were used to assess the factor structure of the SPQ-C in 1668 children ($M = 12.10$, $SD = 0.60$ years) from the China Jintan Child Cohort Study. findings document a three-factor structure and partial measurement invariance across residential location and gender, replicating the psychometric properties of the SPQ-C in English. The Chinese SPQ-C further correlates with standard behavioral problems (i.e., Child Behavior Checklist, Youth Self-Report and Teacher Report Form), demonstrating construct validity and utility as a child psychopathology assessment tool. findings provide the first robust psychometric evidence for a three-factor structure of the Chinese SPQ-C in a large Mainland Chinese sample, and suggest that the SPQ-C is suitable as a screening tool for schizotypy in community children who may be at risk for behavioral problems and later psychosis (Liu, Wong, Dong, Raine, Tuvblad, 2019).

In one paper examined the factorial validity of the original and two short form versions of the (RCADS) adapted for adults, using confirmatory factor analysis with a convenience sample aged 18–67. All versions of the RCADS were found to provide reliable measures of general anxiety and depression in adults and of most subdimensions of anxiety corresponding to the original version of the RCADS. However, anxiety subdimension reliability was primarily driven by the strong general anxiety dimension, due to the high comorbidity between anxiety subtypes (McKenzie, Murray, Freeston, Whelan, Rodgers, 2019).

In one study conducted two Confirmatory Factor Analyses for each of the two versions of the CBCL (ages 1.5–5 and ages 6–18) in a large sample of children with ASD: one on the established measurement model and one on the structural model produced from an Exploratory Factor Analyses. Results shown that the established CBCL factor structure was the best fitting model for young children with ASD, but not for older children with ASD. Models produced from Exploratory Factor Analyses provided evidence that the underlying behavioral constructs measured by the CBCL for ages 6–18 are different in children with ASD than among the typically developing sample. The results of this study have implications regarding how the CBCL should be interpreted in children with ASD (Medeiros, Mazurek, Kanne, 2017).

In one study to design and validate a new scale for the assessment of food neo-phobia and pickiness, thus filling a major gap in the psychometric assessment of food rejection by French children and concentrated on French children aged 2–7 years, as no such scale exists for this young population, and on the two known dimensions of food rejection, namely food neophobia and pickiness, as the nature of the relationship between them is still unclear. A factor analysis confirmed the two-dimensional structure of the scale. Internal consistency, test–retest reliability, and convergent and discriminant validity were all satisfactory. Moreover, results from the food choice task showed that scores on the CFRS accurately predicted children's attitudes toward new and familiar foods. Taken together, these findings suggest that the CFRS, a short and easy-to-administer scale, represents a valuable tool for studying food rejection tendencies in French children (Rioux, Lafraire, Picard, 2017).

In the one study developed the 22-item Sensory Eating Problems Scale (SEPS) to measure sensory aspects for children surrounding eating, documented psychometrics of SEPS subscales, and examined their association with mealtime behavior problems. Exploratory factor analysis of the sensory feeding items identified six SEPS subscales with acceptable goodness-of-fit, internal reliability, and test-retest reliability: Food Touch Aversion, Single Food Focus, Gagging, Temperature Sensitivity, Expulsion, and Overstuffing (Seiverling, Williams, Hendy, Adams, Yusupova, Kaczor, 2019).

In one study aims to evaluate the psychometric properties of a measure of parent restrictive feeding practices, the Kids' Child Feeding Questionnaire-Restriction (KCFQ-R), from the youth perspective. Initial exploratory factor analysis and communalities yielded a single factor solution explaining 39.93% of the variability in the data. Internal consistency using the seven items was .73. The KCFQ-R demonstrated external validity through its significant relationship with parent concern about child overweight. Results provide preliminary support that the KCFQ-R is a psychometrically sound and



reliable measure of youth-reported parental restrictive feeding practices. Given the mixed research on the effects of parent-reported parental feeding restriction on various child outcomes, this youth-report measure may help clarify these relationships. Future research should examine youth-report measures of other parent feeding domains (Stromberg, Minski, Wheeler, Chardon, Janicke, 2017).

In one study aimed: (a) to conduct a reliability generalization meta-analysis to estimate the average reliability of the CAPS scores and to search for characteristics of the studies that may explain the variability among reliability estimates, and (b) to estimate the reliability induction rate of the CAPS. The average alpha coefficients were 0.87, 0.84 and 0.83, respectively for the CAPS total score and its two subscales, Socially Prescribed Perfectionism (SPP) and Self-Oriented Perfectionism (SOP). Regarding O'Connor's version, the average reliability coefficients were 0.82, 0.74 and 0.73, respectively, for SPP, SOP-Critical and SOP-Strivings. Some study characteristics (ethnicity, language, mean age and standard deviation of the scores, psychometric vs applied) showed a statistical association with the reliability coefficients of SPP and SOP. The reliability induction rate was 29.8%. In terms of reliability, the original version of the CAPS present better results than O'Connor's version. The original version of the CAPS is a reliable instrument to be employed with general research purposes, but not for clinical practice (Vicent, Rubio-Aparicio, Sánchez-Meca, González, 2018).

Material and Method

All published peer-reviewed English language research studies examining the psychometric properties, interpretability and feasibility of instrument measures of children were considered for inclusion in the review. Unpublished manuscripts, reviews, guidelines, commentaries and other descriptive articles were excluded. Published abstracts were also not included as the information provided in abstracts is limited and frequently non-peer reviewed. Studies published in languages other than English were also excluded due to time and financial constraints (translation costs). The exclusion of non-English language research studies was minimal.



Results

Table 1: Instrument valid about child

No.	Acronym	Name of Scale	Author(s)	year	Rationale for exclusion
1	SCAS-P	Spence Child Anxiety Scale for Parents	Ramona Toscano, Andrew J. Baillie, Heidi J. Lyneham, Anna Kelly, Theresa Kidd, Jennifer L. Hudson	2020	children aged 7 to 18 years with a diagnosis of an anxiety disorder or Autism Spectrum Disorder (ASD)
2	SEC	Social-emotional competence	Susanne A. Denham, Hideko H. Bassett, Katherine M. Zinsser, Isabel S. Bradburn, Craig S. Bailey, Elizabeth A. Shewark, David E. Ferrier, Kristi H. Liverette, Jessica Steed, Samantha P. Karalus, Saeid Kianpour	2020	For Preschool child's
3	OHRQoL	Child Perceptions Questionnaire for oral health-related quality of life	Maisa Omara; Tanja Stamm; Maren Boecker; Valentin Ritschl; Erika Mosor; Thomas Salzberger; Christian Hirsch; Katrin Bekes	2019	for children aged 11 through 14 years
4	FAQLQ-PF	Brazilian version of two quality-of-life questionnaires in food allergy - for children and their parents	Raquel Bicudo Mendonc, Dirceu Solé, Audrey DunnGalvin, Claudio Arnaldo Len, Roseli Oselka Saccardo Sarni	2019	parents of children under 6 years of age with food allergy
5	ASQ-3	ages and stages questionnaires	Luisa Schonhauta, Silvia Martinez-Nadal, Ivan Armijo, Xavier Demestre	2019	Late preterm and term-born infants at 24 and 48 months
6	ACC	Assessment Checklist for Children	Tabea Symanzik, Arnold Lohaus, Ann-Katrin Job, Sabrina Chodura, Kerstin Konrad, Nina Heinrichs, Vanessa Reindl	2019	children - aged between 2 and 7 years
7	CPSS-SR-5	Child PTSD Symptom Scale	Ricardo J. Pinto, Patricia Correia Santos, Maria Castro, Inês Jongenelen, Alytia Levendosky, and Ângela Costa Maia	2019	between 13 and 17 years old who had experienced at least one traumatic event or one childhood adversity
8	PACQ	Preoccupied and Avoidant Coping Questionnaire	Tatiana Marci, Ughetta Moscardino, Pietro De Carli, Gianmarco Altoé	2019	children aged 7.6–11.7 years
9	-	Parent–Child Interaction Outcome Measures	Nicole Gridley, Sarah Blower, Abby Dunn, Tracey Bywater, Karen Whittaker, Maria Bryant	2019	Child's aged 0–5 years
10	CFRS	Child Food Rejection Scale	Camille Rioux, Jérémie Lafrairec, Delphine Picardb, Jacqueline Blissettd	2019	child aged between 2 and 7 years
11	PFS	Protective Factors Survey	Jessica Sprague-Jonesa, Jacqueline Counts, Mallory Rousseau, Casandra Firman	2019	parent
12	-	Persian test of speech stimulability scale	Akram Ahmadi, Reyhane Mohamadi, Abbas Ebadi, Mohammad Kamali, Talieh Zarifian, Mehdi Dastjerdi Kazemi	2019	age range of 3-5 years
13	PRISMA	Preferred Reporting Items for Systematic Review and Meta-Analyses	Rob Trubey, Chao Huang, Fiona V Lugg-Widger, I Kerenza Hood, Davina Allen, Dawn Edwards, David Lacy, Amy Lloyd, Mala Mann, Brendan Mason, Alison Oliver, Damian Roland, Gerri Sefton, Richard Skone, Emma Thomas-Jones, Lyvonne N Tume, Colin Powell	2019	age 0–18 years
14	ChYMH	Child and Youth Mental Health	Chloe Laua, Shannon L. Stewart, Donald H. Saklofske, John Hirdes	2019	children/youths 4 to 18 years of age



15	KSADS-COMP	Kiddie Schedule for Affective Disorders and Schizophrenia	Lisa Townsend, Kenneth Kobak, Catherine Kearney, Michael Milham, MD, Charissa Andreotti, Jasmine Escalera, Lindsay Alexander, Mary Kay Gill, Boris Birmaher, MD, Raeanne Sylvester, Dawn Rice, Alison Deep, Joan Kaufman,	2019	youth ages 6-18
16	SPQ-C	Schizotypal Personality Questionnaire - Child	Jianghong Liu , Keri Ka-Yee Wong , Fanghong Dong, Adrian Raine , Catherine Tuvblad	2019	child aged 11-14 years
17	RCADS	Revised Children's Anxiety and Depression Scales	Karen McKenzie, Aja Murray, Mark Freeston, Kathryn Whelan, Jacqui Rodgers	2019	-
18	SEPS	Sensory Eating Problems Scale	Laura Seiverling, Keith E. Williams, Helen M. Hendy, Whitney Adams, Stella Yusupova, Aleksandra Kaczor	2018	children 24 months and older
19	ICAST-Trial	ISPCAN Child Abuse Screening Tool for use in trials	Franziska Meincka, Mark E. Boyes, Lucie Cluvera, Catherine L. Ward, Peter Schmidt, Sachin DeStone, Michael P. Dunne	2018	For mean aged 14 years
20	CASSS-HB	Child and Adolescent Social Support Scale for Healthy Behaviors	Sevil Albayrak, Biriz Çakır, Fatma Nis, ançı Kılınç, Ozge Vergili, Yurdagül Erdem	2018	children aged 11-14 years
21	AHEMD	Affordances in the Home Environment for Motor Development inventory	Saeed Valadi, Carl Gabbard, Elahe Arabameri, Ali Kashi, Abdollah Ghasemi	2018	children aged 18–42 months
22	CAPS	Child and Adolescent Perfectionism Scale	Maria Vicent , Maria Rubio-Aparicio , Julio Sanchez-Meca, Carolina Gonzalvez	2018	-
23		Kid-KINDLR for Hospitalized Children in Chile	Fernanda Viotti, Marta Badiá, M. Begoña Orgaz, Ana M. Ullán, Juan Sebastián Urzúa	2018	children aged 7-13 years
24	SWAIY	Social Worries Anxiety Index for Young children	Suzannah Stuijzfand, Helen F. Dodd	2017	children aged 4–8 years
25	ADHD RS-IV	ADHD Rating Scale e IV	A.E. Pritchard, C.M. Stephan, T.A. Zabel, L.A. Jacobson	2017	for youth between the ages of 5 and 18
26	CALIS-PV	child anxiety life interference scale – Preschool version	Tamsyn J. Gilbertson, Amy J. Morganc, Ronald M Rapeee, Heidi J. Lyneham, Jordana K. Bayerb	2017	child aged 3–7 years
27	CBCL	Child Behavior Checklist	Kristen Medeiros, Micah O. Mazurek, Stephen Kanne	2017	For ages 6–18 are different in children with ASD than among the typically developing sample
28	CFRS	Child Food Rejection Scale	C. Riouxa, J. Lafrairea, D. Picard	2017	children aged 2–7 years,
29	KCFQ-R	Kids' Child Feeding Questionnaire-Restriction	Stromberg SE, et al.	2017	children ages 8—17
30	CREI-PC	Childhood Religious Experiences Inventory – Primary Caregiver	Adam E. Tratner, Yael Sela, Guilherme S. Lopes, Alyse D. Ehrke, Viviana A. Weekes-Shackelford, Todd K. Shackelford	2017	between 18 and 34 years



Child Food Rejection Scale (CFRS)

The CFRS, which was initially developed and validated in France by Rioux et al. (2017), was first translated into English through a forward backward translation process, according to the recommended guidelines for scale translation (Hambelton, Meranda, & Spielberger, 2005; Vallerand, 1989). (i) First, two bilingual speakers, whose first language was English, translated the original French CFRS into English. (ii) Two bilingual speakers, whose first language was French, then independently back translated the two preliminary English versions into French. These two new French versions were compared to identify discrepancies and negotiate an updated French version. (iii) The original French version and the updated French version were then compared to assure conformity. (iv) Finally, a sample of 19 bilingual speakers responded to the two versions (English and original French version) with a two-week interval. They were additionally asked to indicate whether the items were clear and correctly phrased. From their comments, the wording of the English version was slightly modified. The correlation between the score to the French original version and the final English version was high ($r=0.87$, $p < 0.0001$).

The CFRS is a bi-dimensional scale that comprises a total of 11 items; caregivers are asked to what extent they agree with 6 statements regarding their child's neophobia (dimension 1) (e.g. "My child always chooses familiar foods") and 5 statements regarding their child's pickiness (dimension 2) ("My child refuses certain foods due to their texture"). The CFRS represents an efficient and valuable tool for studying food rejection tendencies in young French children through their caregivers (Rioux et al., 2017); nevertheless it is currently available only in French.

Similarly to the procedure used in Rioux (2017) for the French sample, English caregivers rated each item according to their child's behavior on a 5-point Likert-like scale (Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree). Each answer was then numerically coded. For each child, three scores can be obtained: a food neophobia sub-score (range from 6 to 30), a food pickiness subscore (range from 5 to 25) and a (total) food rejection score (range from 11 to 55). As the original French CFRS does not contain any reversescored items (Rioux et al., 2017) the neophobia sub-score is obtained by simply summing the score for each neophobia item, and the same procedure is followed for the pickiness sub-score. The total food rejection score is obtained by summing the neophobia and pickiness subscores. High scores indicate high food rejection dispositions.

Conclusions

This systematic review provides evidence of the psychometric properties and feasibility of commonly used instrument about child's measures. Findings shown that for children under 2 years of age, few psychometric tools have been evaluated. Therefore, it is recommended that future researchers target tools made for children under 2 years of age.

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