

A Review of Methods to Assess Parental Feeding Practices and Preschool Children's Eating Behavior: The Need for Further Development of Tools.

Blandine De Lauzon-Guillain, Andreia Oliveira, Marie Charles, Evangelia Grammatikaki, Louise Jones, Natalie Rigal, Carla Lopes, Yannis Manios, Pedro Moreira, Pauline Emmett, et al.

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1 **Author's page**

2 **Title**

3 A review of methods to assess parental feeding practices and preschool child's eating
4 behavior: the need for further development of tools.

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131

132

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140

141 **Abstract**

142 **Title**

143 A review of methods to assess parental feeding practices and preschool child's eating
144 behavior: the need for further development of tools.

145 **Unstructured Abstract**

146 The aim of the present study was to review existing tools from both observational and
147 experimental studies in humans developed to measure parental feeding practices, child's
148 eating behavior and child's food intake or preferences in 0 to 5 year-olds. Two electronic
149 literature databases (Medline, Psycinfo) were used to search for documents. The selected
150 papers for the review were those presenting tools with data on internal consistency and/or
151 test-retest reliability and/or construct validity. A total of 3,445 documents were retrieved and
152 further searching of reference lists and contact with experts produced an additional 18 papers.
153 We identified three tools on the qualitative dimension of child's eating behavior, two tools on
154 food intake or preferences, and one tool on parental feeding practices with rigorous testing of
155 internal consistency, construct validity and test-retest reliability. All other tools presented in
156 this review need further evaluation of their validity or reliability. As major gaps, we
157 highlighted the need for more tools on parental attention to child's hunger and satiety cues,
158 and to evaluate the degree of control allowed to children younger than 2y in feeding events.
159 Food avoidance (behaviors or strategies to take away and to reject food) and food approach
160 (attractivity for food stimuli) have not been assessed in children aged 12-24 months. Food
161 preference tests based on sensory aspects rather than nutritional quality might be worth
162 investigating. We emphasized the need for further evaluation of quality, especially test-retest
163 reliability and construct validity, for most tools developed in 0 to 5-year old children.

164

165 **Manuscript text**

166 **Title**

167 A review of methods to assess parental feeding practices and preschool child's eating
168 behavior: the need for further development of tools.

169 **Introduction and purpose**

170 Evidence indicates that dietary habits acquired in early childhood persist through to adulthood
171 ¹, highlighting the need for rigorous investigations of the determinants of child's eating
172 behaviors in the first years of life. Child's eating behaviors are multidimensional and can be
173 characterized by answering questions on "how", "how much" and "what to eat". In the present
174 paper, these behaviors have been conceptualized in terms of both qualitative and quantitative
175 dimensions of eating.

176 The qualitative dimensions of children's eating behaviors have been explored in many
177 studies. Some dimensions may lead to overeating: Food responsiveness (tendency of the child
178 to respond to environmental food cues rather than satiety), Enjoyment of food (general
179 responsiveness to food and interest in eating) and Emotional overeating (child's tendency to
180 eat more in reaction to negative emotions) ²⁻⁵, whereas other dimensions may lead to
181 undereating: Slowness in eating (reduction in eating rate as a consequence of lack of
182 enjoyment and interest in food), Satiety responsiveness (degree to which the child ceases
183 eating or chooses not to initiate eating based on their perceived fullness), Emotional
184 undereating (child's tendency to eat less in reaction to negative emotions), Fussiness (child
185 eating a limited variety of foods due to rejection of a substantial amount of familiar as well as
186 'new' foods), and Neophobia (systematic refusal of novel foods) ⁵⁻⁸. For example, links
187 between the qualitative dimensions of eating behavior and child's obesity/overweight have
188 been established ⁹. Other dimensions of children's eating behavior have been shown to
189 contribute to low vegetable intake: food neophobia (reluctance to eating or avoidance of new
190 foods) and pickiness (resistance to eating familiar foods) ¹⁰.

191 The question of 'what to eat' have been investigated in several studies including a
192 quantitative dimension and mainly using Food Frequency Questionnaires ¹¹⁻¹³ or Food
193 Preference Questionnaires ¹⁴⁻¹⁷. Most of these studies highlight that children's diets do not
194 meet nutritional guidelines. Young children are highly dependent on parents and caregivers in
195 terms of the type and amount of food offered. They are also impacted by the parental feeding
196 practices or styles used, i.e. specific behavioral strategies employed by parents to promote or
197 discourage their child in relation to eating or a parents' involvement with the feeding of their
198 child ¹⁸. Parental feeding styles can be characterized in four dimensions: *authoritarian* (telling
199 their children exactly what to eat), *permissive* (allowing their children to eat whatever and
200 whenever they wish), *authoritative* (providing rules and guidance on eating without being
201 overbearing) and *neglectful* (disregarding the children's eating, and focusing on other
202 interests) ¹⁹⁻²². Parental feeding practices and styles have been shown to impact on both
203 children's eating behavior and their weight status. For example, food neophobia in children
204 was found to be positively associated with parental use of coercion or monitoring ^{23, 24},
205 rewards and contingency ^{25, 26}, and preparation of special dishes to encourage him/her to eat
206 ^{25, 26}. Additionally, parental control of child feeding was found to decrease a child's ability to
207 respond to internal cues of hunger and satiety ²⁷ and to be positively related to their weight
208 status ²⁸⁻³⁰. Again, links have been found between on one hand parental feeding styles and on
209 the other hand children's food intake ^{21, 22}, children's eating behavior ²⁶ or children's
210 weight/BMI ^{19, 31-33}.

211 In general, children's intake of healthy foods such as fruit and vegetables remains below
212 recommendations, and the prevalence of overweight/obesity has increased in most developed
213 countries ^{34, 35}. Therefore, the need to influence children's food choices is paramount.
214 However this demands an understanding of the developmental factors that impede the

215 acceptance and consumption of healthy foods. Although studies examining links between
216 parental influence and childhood eating and weight status have increased dramatically in
217 recent years, we do not yet have a definitive answer. Experimental designs are of great
218 importance in highlighting the mechanisms for developing healthy food habits. However,
219 longitudinal epidemiological studies, conducted on large samples based on the general
220 population, are also needed to understand the development of eating behavior and food habits
221 throughout infancy and early childhood. These allow the study of critical periods and critical
222 factors in this development, and the identification of early eating behaviors or food habits that
223 are related to later unhealthy eating habits or later risk of nutritionally related diseases. In
224 order to implement such studies, researchers need to use validated tools suitable for large
225 population-based epidemiological studies.

226 The scope of the current work was to review tools designed to assess, on one hand, child's
227 eating behaviors, that encompass quantitative and qualitative dimensions of eating, and on the
228 other hand, parental feeding practices and styles. Given the importance of early childhood in
229 establishing healthy eating habits^{1,36}, this review focused on the period from the beginning of
230 life until the age of 5.

231 The specific objectives of the present review were 1/ to identify existing tools assessing
232 preschool child's eating behaviors, parental feeding practices and styles with at least one
233 aspect of measurement quality tested and usable in large-scale studies; 2/ to summarize data
234 available for each tool to assess its effectiveness; 3/ to discuss gaps in tools to assess parental
235 feeding practices and child's eating behaviors in infants and preschool children. The present
236 review will help researchers in their choice of tools, and highlight needs for further
237 methodological developments, in particular the development of new tools when gaps were
238 identified or further assessment of quality in existing tools.

239

240 **Material and Methods**

241 *Search strategy*

242 In the first step, two electronic literature databases (Medline and Psycinfo) were selected to
243 search for documents in any language from the year of database inception until March 17,
244 2010. The search syntax included two key elements: terms for methodology (questionnaire,
245 test, tool, experiment, assessment, measure, instrument, scale) and terms for parental feeding
246 practices (feeding behavior, feeding practices) or for eating behavior (eating behavior,
247 appetite, satiation, satiety, neophobia, fussiness, fussy eating, choosiness, picky, pickiness,
248 selective eating, selectivity) or for food habits and preferences (food preferences, food
249 diversity, food variety, food habits, meal frequency, food intake). The filter for studies in
250 humans and among all infants (birth-23 months) and preschool children (2-5 years) was
251 activated. In the second step, reference lists for retrieved documents were searched for
252 additional documents of interest. An additional paper³⁷ was also included in the review, even
253 though it was published on March 26, 2010 because it filled an important gap in the
254 assessment of child's eating behavior. Finally, one additional paper³⁸ was included through
255 contact with experts.

256 *Inclusion criteria*

257 Papers selected for the review were those presenting tools for infant or preschool children (0-
258 5y) with at least one aspect of tool validity or reliability tested, such as internal consistency (a
259 measure of the extent to which items in a questionnaire (sub)scale are correlated
260 (homogeneous)), test-retest reliability (the degree to which repeated measurements in stable
261 persons provide similar results), construct validity (correlation with another measurement of
262 the same or similar constructs).

263 *Exclusion criteria*

264 The exclusion criteria were defined and discussed between five review centers. The
265 discussion on exclusion criteria was based on a subsample of 30 documents. Each review

266 center selected separately the relevant papers. Discrepancies across review centers were found
267 for 7 papers. For these papers, documents were re-examined during a workshop and
268 disagreement was resolved by discussion and further precision in exclusion criteria.
269 Finally, it was agreed to exclude from the review the following papers that did not met the
270 inclusion criteria: a) those purely focused on breastfeeding (i.e. the promotion of
271 breastfeeding, issues with breastfeeding); b) papers on the assessment of feeding practices by
272 breastfeeding duration or age of introduction of specific food groups; c) papers on diversity or
273 quality scores which were not considered as specific tools; d) papers on assessment of
274 children's taste preferences rather than food preferences; e) papers using a tool without
275 providing new reliability data; f) papers with validity data only among children older than 5y.
276 We also agreed to exclude papers on preterm infants before hospital discharge, on infants or
277 mothers with HIV/AIDS, on infants with malnutrition or specific illness, given that potential
278 determinants of infant feeding and behavior might differ in these contexts, and papers
279 describing tools based on videotaping of meals, given that their use might be difficult in
280 large-scale studies;
281 Papers in English, Spanish and French were considered. Four papers in Japanese, one in
282 Chinese, one in Italian and one in German were not considered due to the lack of skills of any
283 of the reviewers in these languages.

284 *Papers' selection*

285 Documents identified were divided between five review centers, with a total of 8 reviewers
286 (BdLG, AO, EG, SMP, NR, LJ, PM, CL) for further evaluation, first using the titles, then
287 using the abstract and finally using the full text.

288 *Data extraction*

289 The data were extracted separately in three fields: parental feeding practices (NR, SMP, EG),
290 qualitative aspects of child's eating behavior (BdLG) and more quantitative aspects of child's
291 eating behavior, i.e. child's food intake/preferences, (LJ, AO, CL, PM). Data extracted
292 included: country of origin, sample characteristics, mode of tools' administration, list of items
293 and scales, scoring method, internal consistency, test-retest reliability and/or construct
294 validity data. BdLG checked the exhaustiveness in the extraction process.

295 *Quality Assessment.*

296 All tools were assessed against three quality criteria (definitions provided in the inclusion
297 criteria section):

- 298 ▪ Assessment of internal consistency: Cronbach's $\alpha \geq 0.7$
- 299 ▪ Assessment of test-retest reliability: correlation's coefficient ≥ 0.7
- 300 ▪ Assessment of construct validity: correlation's coefficient ≥ 0.4

301 Tools were classified as C, when only one of the criteria was achieved and validity was tested
302 in only one sample, C- when at least one criterion was tested but none achieved, C+ when
303 only one of the criteria was achieved and validity was tested in at least two samples, B when
304 two criteria were achieved and validity was tested in only one sample, B- when two criteria
305 were tested but none achieved, B+ when two criteria were achieved and validity was tested in
306 at least two samples, A when all criteria were achieved and validity was tested in only one
307 sample, A+ when all criteria were achieved and validity was tested in at least two samples.

308 Literature coming from one research group was handled together and not counted separately,
309 unless a new sample was used to replicate findings.

310 Tools with a quality rating labelled A or A+ were considered as having established validity
311 and reliability. Other tools were considered as needing a more complete internal testing and
312 assessment of reliability and validity.

313 An important aspect relating to the use of these tools in large-scale epidemiological studies is
314 the length of each questionnaire which will add to subject burden and cost. The number of
315 questions in each part of the tool is included in the tables.

316

317 **Results**

318 A total of 3,445 documents were retrieved from the electronic database search, of which 166
319 met the inclusion criteria. Sixteen additional papers, identified through reference lists of
320 retrieved documents, and two additional papers^{37, 38} identified through contact with experts
321 were also included in the review.

322 Ninety-one papers described tools or their reliability or validity, some of them describing
323 more than one tool: 41 papers described a total of 21 tools on parental feeding practices
324 published between 1983 and 2010, 29 papers described a total of 14 tools on child eating
325 behavior published between 1991 and 2010 and 29 papers described a total 19 tools to assess
326 food habits or preferences in children aged 0-5y.

327 *Tools to assess qualitative aspects of child's eating behavior*

328 Three tools designed to assess the qualitative dimension of eating behavior in children aged 0-
329 5y had a complete internal testing and assessment of test-retest reliability and construct
330 validity: the *Children's Eating Behavior Questionnaire*⁵, the QENA³⁹, and the *Lifestyle*
331 *Behavior Checklist*⁴⁰. These tools, as well as data available on reliability assessment, are
332 described in Table 1.

333 Eleven additional tools, briefly presented in Table 2, had been developed but need further
334 evaluation before use. All these tools had been tested in at least one sample of children and
335 details of data available on validity or reliability analyses are summarized in the
336 Supplementary table. For all these tools on the qualitative dimension of child's eating
337 behavior, **internal consistency**, assessed by Cronbach's α , was satisfactory (within the 0.70-
338 0.90 limits), but **test-retest reliability** had been assessed for only four and **construct validity**
339 had been assessed for only three .

340 The number of items per questionnaire ranged from one for the *Satiety scale*⁴¹ to 40 for the
341 *Child Eating Behavior Inventory*⁴². The number of scales ranged from one in the *Children*
342 *Food Neophobia Scale*⁴³, the *Food Neophobia scale* from Nicklaus⁴⁴, the *Feeding Problem*
343 *Score* from Dahl⁴⁵, the modified *Dietary Restraint scale of the Dutch Eating Behavior*
344 *Questionnaire*⁴⁶ and the questionnaire from Galler⁴⁷ to eight in the *Child Eating Behavior*
345 *Inventory*⁴², with a median number of 5 items per scale.

346 *Tools to assess quantitative aspects of child's eating behavior (food*
347 *intake/preferences)*

348 Most studies used common nutritional epidemiological tools (food frequency questionnaires,
349 24-h recalls, food records or diet histories) to assess child's food intake. We present here only
350 tools specifically designed for and tested in children aged 0-5y.

351 Only one food frequency questionnaire, designed to estimate specific intakes of healthy foods
352¹¹ in children aged 5y or above, and one preference test (58) had complete internal testing and
353 assessment of test-retest reliability and construct validity and are described in Table 1.

354 Eight additional food frequency questionnaires, one food record, one web assessment of food
355 intake, three preferences' tests and four food preferences questionnaires had been developed
356 to assess the quantitative aspects of eating behavior in children aged 0-5y but need further
357 evaluation before use. These tools are briefly presented in Table 2. All these questionnaires
358 were tested in at least one sample of children and details of data available on validity or
359 reliability analyses are summarized in the Supplementary table.

360 *Tools to assess parental feeding practices*

361 One tool designed to assess the parental feeding practices for children aged 0-5y had
362 complete internal testing and assessment of test-retest reliability and construct validity: the
363 *Child Feeding Questionnaire*²⁰. This tool, as well as data available on reliability assessment,
364 is described in Table 1.

365 Nineteen additional tools, briefly presented in Table 2, had been developed to assess the
366 parental feeding practices for children aged 0-5y but need further evaluation before use. All
367 these tools had been tested in at least one sample of children and details of data available on

368 validity or reliability analyses are summarized in the Supplementary table. For most tools,
369 **internal consistency**, assessed by Cronbach's α , was satisfactory (within the 0.70-0.90
370 limits), but only four tools presented data on **test-retest reliability**, and the **construct**
371 **validity** had been assessed only in one.

372 The number of items ranged from 5 for the *Response To Food Refusal* questionnaire⁴⁸ to 105
373 items for the *Infant Feeding Style Questionnaire*⁴⁹. The number of scales ranged from 1 in
374 the *Restricted-Access Questionnaire*⁵⁰, the *Maternal Feeding Attitude* questionnaire⁵¹, the
375 *Response To Food Refusal* questionnaire⁴⁸ and the *Parental Control Index*²⁴ to 12 in the
376 *Comprehensive Feeding Practices Questionnaire*⁵², with a median number of 6 items per
377 scale.

378

379 **Discussion:**

380 Only six tools achieved all validation criteria, with testing of internal consistency, test-retest
381 reliability and construct validity in more than one sample of children aged 0-5y: for child's
382 eating behavior (n=3), child's food intake or preferences (n=2), and parental feeding practices
383 (n=1). No tool had been designed for children younger than 18 months.

384

385 *Summary of tools with achieved validity and reliability criteria*

386 In the qualitative aspects of child's eating behavior, the *QENA*³⁹, focusing on food
387 neophobia, achieved all validity and reliability criteria in more than one sample. However, it
388 was designed for children aged at least 5y. The *Children's Eating Behavior Questionnaire*
389 from Wardle⁵, designed for children aged 2y and more, also had extensive validity and
390 reliability data described but all criteria were achieved only for the enjoyment of food scale.
391 In particular, construct validity had not been tested for several scales. The *Lifestyle Behavior*
392 *Checklist*⁴⁰ also achieved all validity and reliability criteria but only in one sample, therefore
393 these results need to be reproduced in another sample before it can be used with confidence.

394 In the child's food intake or preferences field, all validity and reliability criteria were
395 achieved in one sample by the Magarey's *Children's Dietary Questionnaire*¹¹, focusing on
396 intake of healthy foods in children aged 5y and more, and by the *Food Preferences test* from
397 Calfas⁵³. These results need to be reproduced in another sample.

398 Finally, in the parental feeding practices field, the *Child Feeding Questionnaire* by Birch²⁰
399 was the only tool with rigorous assessment of internal consistency, test-retest reliability and
400 construct validity, in different samples. It was designed for children from 5 years but had also
401 been used among children aged 1.5 to 4 years. However, even for this tool, construct validity
402 had been tested only on a subset of scales: restriction, pressure and monitoring; and test-retest
403 reliability had been examined only for: restriction, monitoring pressure to eat and food as
404 reward. The criteria for construct validity had not been achieved for both monitoring and food
405 as reward scales. The use of the additional tools covered in this review should be preceded by
406 further validity and reliability tests.

407 *Selection of tools depending on the purpose of the study*

408 In the choice of a particular tool, researchers should keep in mind that each tool was
409 developed in a specific context. In general, certain parental feeding practices scales, such as
410 restriction, pressure to eat, use of food as reward, or emotion regulation, had been developed
411 to examine more deeply the links between parental feeding practices and childhood obesity or
412 obesity proneness, whereas other dimensions such as food availability, verbal praise,
413 encouragement, teaching nutrition, modeling or child's involvement, had mainly been
414 developed to identify feeding practices that potentially influence child's diet variety or food
415 preferences. Ogden et al⁵⁴ underlined the relevance of focusing on separate forms of parental
416 control in relation to child's eating: overt control (which can be detected by the child), and
417 covert control (which can't be detected by him/her), since these controls differentially
418 predicted children's snacking behavior. A new development which could be of great

419 importance in understanding the development of a child's relationship with eating is the
420 assessment of parental state during feeding (e.g. irritability).
421 In the same way, child's eating behavior scales had often been developed to assess
422 relationships between child's eating behavior and either body size or later variety of diet or
423 food preferences. Tools covering dimensions of feeding problems, satiety responsiveness,
424 slowness in eating, food responsiveness, appetite, emotional eating, dietary restraint or
425 pickiness, had been designed to examine relationships between child's eating behavior and
426 body size, growth and obesity proneness, whereas scales covering food neophobia, choosiness
427 or selectivity had been designed to examine relationships between child's eating behavior and
428 later diet variety or fruit and vegetable intake. Despite its statistical validation, one limitation
429 of the *CEBQ*⁵ may be its inability to distinguish between pickiness and food neophobia.
430 Another aspect impacting the selection of tools may be the need of comparable assessment of
431 child's eating behavior throughout infancy and early childhood. The *Baby Eating Behavior*
432 *Questionnaire*³⁷, adapted from the *Children's Eating Behavior Questionnaire* from Wardle⁵,
433 could allow similar measurements of eating behavior, at different periods of life, in
434 longitudinal studies. A toddler version of this questionnaire, if developed, would give the
435 opportunity to have a homogenous assessment of child's eating behavior during the whole
436 period from early infancy to 5 years.

437 438 *Gaps in literature*

439 The ability to respect physiological cues (hunger and satiation) during feeding events has
440 been identified as important to obesity prevention⁵⁵. Infants and young children are able to
441 regulate food intake due to these cues but this ability decreases with age^{56,57}. Many tools had
442 already been developed to assess parental feeding practices from birth to five years, although
443 most need validation. Most of these tools assess authoritarian practices, such as pressure to
444 eat or restriction of eating, known to be related to children's eating in the absence of hunger
445 later in life, however, few of the tools focus specifically on parental attention to child's
446 hunger and satiety cues throughout infancy and early childhood. Moreover, the degree of
447 control given to children in feeding events had not been assessed among children younger
448 than two years. So, further studies may consider developing tools to assess these dimensions
449 of feeding practice in infants and very young children. Following the same idea, the
450 assessment of infant's or young child's sensitivity to these internal cues, and food avoidance/
451 approach in 12-24 months may be considered. Finally, in the food intake/preferences field,
452 few tools had been specifically validated in children although several food frequency
453 questionnaires had been designed for use in young children, some focused only on specific
454 aspects of food intake (fruit/vegetable, calcium or dietary fat) and not on total intake. Tools
455 designed to assess food preferences had mainly been developed in preschoolers, focusing on
456 preferences for healthy vs. unhealthy foods. It would be of interest to develop a preferences
457 tool based on the sensorial aspects of foods rather than on their nutritional quality. Due to
458 cultural differences in diet across countries, it may be difficult to develop tool covering food
459 intake and preferences that could be widely used across countries. Nevertheless, future
460 research should tackle this gap in the literature since cross-cultural comparisons will allow
461 greater insight into commonalities and differences across countries in the development of
462 food preferences and eating habits of young children.

463 464 *Strength and limitations of the review*

465 Some questionnaires, validated in older populations, were not included in this review, as only
466 validity or reliability data within the age range 0-5y were considered. However, we
467 considered adaptation for young children of tools designed for older children or adults, when
468 at least one aspect of validity or reliability of this adaptation had been tested.

469 We focused on tools that would be easy to implement in large-scale studies, so we excluded
470 video-coding of child's eating behavior or parental feeding practices, as these methods are
471 time-consuming and expensive. However, these methods would be of great importance to
472 assess construct validity of questionnaires. This review highlights the need for further
473 examination of construct validity of numerous tools.

474 475 *Conclusion*

476 In this review, we summarized all validity and reliability data on tools to assess parental
477 feeding practices and eating behavior in infants and preschool children that would be usable
478 in large-scale studies. Few tools were identified on parental attention to child's hunger and
479 satiety cues, and none to evaluate the degree of control allowed to children younger than 2y in
480 feeding events. Food avoidance (child's behaviors or strategies to take away and to reject
481 foods, includes dimensions of satiety responsiveness, slowness in eating, emotional
482 undereating and food fussiness) and food approach (child's attractivity for food stimuli,
483 includes dimensions of food responsiveness, enjoyment of food and emotional overeating)
484 had not been assessed in children aged 12-24 months. Only six tools were identified being of
485 good quality regarding all our criteria: internal consistency, construct validity and test-retest
486 reliability. We emphasize the need for further evaluation of quality, especially test-retest
487 reliability and construct validity, for most tools developed for use in 0-5 years-old children.
488 These results will be of great importance for pediatricians or epidemiologists/clinical
489 researchers to select a sound tool highlighting child's eating behaviors or parental feeding
490 practices at ages 0 to 5 years, but also for researchers to identify need for further development
491 of tools and more rigorous assessment of existing instruments.

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Name of the tool / Country of origin / Translation	Scales						Description of validity data						
	Age range with validity data (gray filling)						Domains (no. of items): short description	Quality rating ¹	Reference	Study design	Internal consistency ² : Cronbach's α	Construct validity ³	Test-retest reliability ⁴
	<1y	1y	2y	3y	4y	5y							
												without hunger: -0.33; FR-energy intake: 0.28; EF-energy intake: 0.40	
						Emotional undereating	B+	Ashcroft, 2008 ⁶	Observational	4-11y, n=428	at 11y: FR: 0.83; EF: 0.86; EoE: 0.77; SR: 0.79; SE: 0.70; EuE: 0.72; Fu: 0.91		
						EuE (4): child's tendency to eat less in reaction to emotions		Carnell, 2008 ⁷	Observational	3-5y, n=572	SR/SE: 0.81; EF: 0.87		
						Fussiness (5): child eating a limited variety of foods	B+	Viana, 2008 ⁵⁹	Observational	3-13y, n=240	FR: 0.88; EF: 0.89; EoE: 0.77; DD: 0.82; SR: 0.79; SE: 0.88; EuE: 0.70; Fu: 0.73		
								Farrow, 2009 ⁸	Observational	3-6y, n=80	mean: 0.74 for the 1st child of the family and 0.79 for the 2nd child		
QENA						Neophobia (13): systematic refusal of novel foods	A+	Rubio, 2008 ³⁹	Experimental	5-8y, n=166	Neophobia: 0.88	Association with: choice of new foods: -0.41; willingness to try new foods: -0.53	Subsample, n=112, 15 days later Neophobia: 0.76
Origin: France Translation: English													

Name of the tool / Country of origin / Translation	Scales						Description of validity data						
	Age range with validity data (gray filling)						Domains (no. of items): short description	Quality rating ¹	Reference	Study design	Internal consistency ² : Cronbach's α	Construct validity ³	Test-retest reliability ⁴
	<1y	1y	2y	3y	4y	5y							
									Experimental 5-8y, n=603	Neophobia: 0.84	Association with: choice of new foods: -0.34 (-0.32 at 5y); willingness to try new foods: -0.47 (-0.52 at 5y)	Subsample, n=543, 15 days later Neophobia: 0.74	
Lifestyle behavior Checklist Origin: Australia						Behavior problem (26): parental perception of child problem behaviours relating to eating, physical activity, sedentary activity and weight issues Parental confidence in managing the problems (26): parenting self-efficacy in managing these problem behaviours	A	West, 2009 ⁴⁰	Intervention trial and exploratory study 4-11y, n=182	Problem scale: 0.97; Confidence scale: 0.92	Correlation with Eyeberg Child Behavior Inventory – Problem scale: 0.48	2 weeks later Problem scale: 0.87; Confidence scale: 0.66	

	Name of the tool / Country of origin / Translation	Scales					Description of validity data						
		Age range with validity data (gray filling)					Domains (no. of items): short description	Quality rating ¹	Reference	Study design	Internal consistency ² : Cronbach's α	Construct validity ³	Test-retest reliability ⁴
		<1y	1y	2y	3y	4y							
Children's eating behavior: quantitative dimensions	Magarey's Children Dietary Questionnaire Origin: Australia						Healthy vs unhealthy food intake	A	Magarey, 2009 ¹¹	Observational 4-16y, n=540	Fruit and vegetables: 0.76; Fat from dairy: 0.44; Sweetened beverages: 0.13; Non-core foods: 0.56	7-day food checklist, Subsample: n=193 Fruit and vegetables: 0.58; Fat from dairy: 0.60; Sweetened beverages: 0.55; Non-core foods: 0.31	Subsample: n=116 Fruit/vegetables: 0.75; Fat from dairy: 0.51; Sweetened beverages: 0.55; Non-core foods: 0.90
	Calfas's test Origin: US						Food preferences	A	Calfas, 1991 ⁵³	Experimental 3-8y, n=81	Preferences: 0.74	Preference vs actual choice : 66% agreement	1 week later Preferences: 0.70
Parental feeding practices	Child Feeding Questionnaire Origin: US Translation: Spanish German						Perceived responsibility (3): parental perception of their own responsibility in their child eating	C+	Birch, 2001 ²⁰	Observational 5-9y, n=394	Responsibility: 0.88; Child weight: 0.71; Concern about weight: 0.83; Restriction: 0.75; Pressure to eat: 0.70; Monitoring: 0.73; Food as reward: 0.92		
									Davison, 2001 ⁶⁰	Observational 4-6y, n=197	Concern about weight: 0.74 in mothers, 0.77 in fathers; Restriction: 0.78 in mothers, 0.66		

Name of the tool / Country of origin / Translation	Scales						Description of validity data						
	Age range with validity data (gray filling)						Domains (no. of items): short description	Quality rating ¹	Reference	Study design	Internal consistency ² : Cronbach's α	Construct validity ³	Test-retest reliability ⁴
	<1y	1y	2y	3y	4y	5y							
							Perceived child weight (6): parental perception of child's weight status (thinness, normal weight, overweight or obesity)	C+	Fisher, 2002 ⁶¹	Observational 5y, n=196	Restriction: 0.79		
							Concern about weight (3): parental fear for their child to be or become overweight	C+	Taveras, 2004 ⁶²	Observational 1y, n=1160	Restriction: n/a (1 item); Pressure to eat: 0.90		
									Anderson, 2005 ⁶³	Cross-sectional 3-5y, n=231	Confirmatory Factor Analysis, RMSEA=0.043; CFI=0.93		
									Galloway, 2006 ⁶⁴	Experimental 3-5y, n=27	Pressure to eat: 0.73		
							Restriction (8): parental limitation of child food intake	A+	Kasemsup; 2006 ⁶⁵	Observational 3-5y, n=80	Responsibility: >0.70; Child weight: >0.70; Parent weight: 0.28; Concern about weight: >0.70; Restriction: >0.70; Pressure to eat: >0.70; Monitoring: 0.60		

Name of the tool / Country of origin / Translation	Scales						Description of validity data						
	Age range with validity data (gray filling)						Domains (no. of items): short description	Quality rating ¹	Reference	Study design	Internal consistency ² : Cronbach's α	Construct validity ³	Test-retest reliability ⁴
	<1y	1y	2y	3y	4y	5y							
									Ogden, 2006 ⁵⁴	Observational 4-11y, n=125	Restriction: 0.79; Pressure to eat: 0.63; Monitoring: 0.87	Correlation with Overt/Covert control: Restriction-Overt: 0.27; Restriction-Covert: 0.42; Monitoring-Overt: 0.39; Monitoring-Covert: 0.42; Pressure-Overt: 0.46; Pressure-Covert: 0.26	
								A+	Powers, 2006 ²	Observational2-5y, n=296	Restriction: 0.64; Pressure to eat: 0.54		
									Carnell, 2007 ⁶⁶	Observational 3-5y, n=439	Restriction: 0.78; Pressure to eat: 0.73		
								B+	Brown, 2008 ²³	Observational 4-7y, n=518	Restriction: 0.87; Pressure to eat: 0.79		
							Pressure to eat (4): parental attempt to force their child to eat more than it wants						
							Monitoring (3): parents keep track of the snack, high fat or						

Name of the tool / Country of origin / Translation	Scales						Description of validity data											
	Age range with validity data (gray filling)						Domains (no. of items): short description	Quality rating ¹	Reference	Study design	Internal consistency ² : Cronbach's α	Construct validity ³	Test-retest reliability ⁴					
	<1y	1y	2y	3y	4y	5y												
							sweet foods		Corsini, 2008 ²⁹	Observational 4-5y, n=216	Responsibility: 0.93; Child weight: 0.83; Parent weight: 0.69; Concern about weight: 0.74; Restriction: 0.83; Pressure to eat: 0.80; Monitoring: 0.92; Food as reward: 0.83							
												Food as reward (2): parental use of food to reward good behaviour or action of their child	C+	Haycraft, 2008 ⁶⁷	Observational 1.5-6y, n=23		Correlation with mealtime observations Pressure: r=0.08 in mother and 0.36 in fathers Restriction: r=0.05 in mothers and 0.13 in fathers	
														Kroller, 2008 ³²	Observational 3-6y, n=219	Restriction: 0.75; Monitoring: 0.93; Pressure to eat: 0.84; Food as reward: 0.77		subsample: n=35, 14 days later Restriction: 0.77; Monitoring: 0.41; Pressure to eat: 0.78;

Name of the tool / Country of origin / Translation	Scales						Description of validity data						
	Age range with validity data (gray filling)						Domains (no. of items): short description	Quality rating ¹	Reference	Study design	Internal consistency ² : Cronbach's α	Construct validity ³	Test-retest reliability ⁴
	<1y	1y	2y	3y	4y	5y							
												Food as reward: 0.57	
						Perceived parent weight (4) parental perception of their own weight status (thinness, normal weight, overweight or obesity)	C-	Joyce, 2009	Observational 4-8y, n=247	Restriction: 0.82			
								Farrow, 2009 ⁸	Observational 3-6y, n=80	Mean (responsibility, concern about weight, child weight, monitoring, pressure, restriction): 0.75 for child A and 0.74 for child B			

759 FR: Food responsiveness; EF: Enjoyment of food; EoE: Emotional overeating; DD: Desire to drink; SR: Satiety responsiveness; SE: Slowness in
760 eating; EuE: Emotional undereating; Fu: Fussiness

761 ¹ Quality rating : All tools were assessed against three quality criteria: 1/ Assessment of internal consistency: Cronbach's $\alpha \geq 0.7$; 2/ Assessment of
762 test-retest reliability: correlation's coefficient ≥ 0.7 ; 3/ Assessment of construct validity: correlation with another measurement of the same construct \geq
763 0.4. Tools were classified as C, when only one of the criteria was achieved and validity was tested in only one sample, C- when at least one criterion
764 was tested but none achieved, C+ when only one of the criteria was achieved and validity was tested in at least two samples, B when two criteria were
765 achieved and validity was tested in only one sample, B- when two criteria were tested but none achieved, B+ when two criteria were achieved and
766 validity was tested in at least two samples, A when all criteria were achieved and validity was tested in only one sample, A+ when all criteria were
767 achieved and validity was tested in at least two samples.

768 ²Internal consistency: a measure of the extent to which items in a questionnaire (sub)scale are correlated

769 ³Construct validity: correlation with another measurement of the same or similar constructs

770 ⁴Test-retest reliability: correlation between two assessments 1-4 weeks apart

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772 Table 2. Summary of tools that needs further reliability and validity assessment

	Name of the tool / Country of origin / Translation	Scales					References		
		Age range with validity data (gray filling)						Quality rating ¹	
		<1y	1y	2y	3y	4y			5y
Children's eating behavior: qualitative dimensions	Children Eating Behavior Inventory Origin: Canada						Feeding problems (40): eating and mealtime problems	B	Archer, 1991 ⁴²
	Children Food Neophobia Scale from Pliner Origin: Canada Translation: French, German						Neophobia (6): systematic refusal of novel foods	C+	Pliner, 1994 ⁴³ Cooke, 2004 ⁵⁸ Wardle, 2005 ²⁴ Russel, 2008 ⁶⁸
	Behavioral Pediatrics Feeding Assessment Scale Origin: Canada						Eating problems (35): behaviours related to poor nutritional intake	B	Crist, 1994 ⁶⁹ Crist, 2001 ⁷⁰
	Questionnaire from Galler Origin: Barbados						Preference for breastfeeding (7): importance of breast-feeding in the baby diet and satisfaction of the baby with breastfeeding	C	Galler, 1998 ⁴⁷
							Father helps (4): help of the father and grandmother in taking care of the baby	C-	
							Feeding intensity (4): intensity of sucking and strong interest in feeding	C-	
							Relatives help (5): help of relatives in taking care of the baby, baby feeds on demand	C-	
						Feeding difficulty (3): grandmother help with baby and baby fusses during feeding	C-		
	Satiety Scale Origin: US						Satiety (1): child sensitivity to internal satiety cues	n/a	Faith, 2002 ⁴¹
	Children Food Neophobia Scale from MacNicol Origin: UK						Neophobia (5): systematic refusal of novel foods	C	Brown, 2008 ²³

Name of the tool / Country of origin / Translation	Scales					References	
	Age range with validity data (gray filling)						Quality rating ¹
	<1y	1y	2y	3y	4y 5y		
modified Dietary Restraint scale Origin: US					Restraint (10): conscious limitation of the diet to control weight	C- Shunk, 2004 ⁴⁶	
Food Neophobia Scale from Nicklaus Origin: France					Neophobia (10): systematic refusal of new foods	C Nicklaus, 2005 ⁴⁴	
Questionnaire from Wright Origin: UK					Appetite (1): infant appetite	n/a Wright, 2006 ⁴⁸	
					Oromotor dysfunction (4): infant trouble with sucking, swallowing or choking	n/a	
					Avoidant eating behavior (8 at 8mo, 6 at 30mo): infant behavior to avoid eating foods	B	
					Maternal feeding anxiety (2): feeding time perceived as relaxed or stressful event	n/a	
					Response to food refusal (5): parental behaviour if the child does not finish part of a meal	C-	
Feeding Problem Questionnaire from de Moor Origin: The Netherlands Translation: English					Difficulty to feed (4): infant perceived as poor eater, faddy or with bad behaviour at mealtime	n/a Wright, 2007 ⁷¹	
					Pickiness (4): poor and selective eating	C de Moor, 2007 ⁷²	
Baby Eating Behavior Questionnaire Origin: UK					Disturbing mealtime (4): disturbing behaviour during mealtime	C-	
					Enjoyment of food (4): infant's liking of milk and feeding	C Llewellyn, 2010 ³⁷	
					Food responsiveness (7): how demanding the infant is with regard to being fed and their responsiveness to feeding cues	C	
					Satiety responsiveness (3): how easily the infants gets full during feeding	C	
				Slowness in eating (4): speed with which the infant	C		

	Name of the tool / Country of origin / Translation	Scales					References		
		Age range with validity data (gray filling)						Quality rating ¹	
		<1y	1y	2y	3y	4y			5y
							finishes feeding		
Children's eating behavior: quantitative dimensions	New Zealand Children's Nutrition Survey FFQ Origin: New Zealand						Food intake	B	Metcalf, 2003 ⁷³
	Anderson's FFQ Origin: Norway						Food intake	C	Anderson, 2003 ⁷⁴
	Klohe's FFQ for a tri-ethnic population Origin: US						Food intake	B	Klohe, 2005 ⁷⁵
	Hammond's FFQ Origin: UK						Food intake	C	Hammond, 1993 ¹²
	Campbell's FFQ Origin: Australia						Food intake	C	Campbell, 2006 ⁷⁶
	Davies's Dietary record Origin: UK						Food intake	C	Davies, 1994 ¹³
	Young Children's Nutrition Assessment on the Web Origin: Belgium						Food intake	C	Vereecken, 2009 ⁷⁷
	Saint Louis University for Kids FFQ Origin: US						Fruit and Vegetables intake	B	Linneman, 2004 ⁷⁸ Haire-Joshu, 2008 ⁷⁹
	Huybrechts's FFQ Origin: Belgium						Calcium intake	B	Huybrechts, 2006 ⁸⁰
	Dietary Fat Questionnaire Origin: US						Dietary fat	C	Dennison, 2000 ⁸¹
	Bell's Qx (3.5y-4.5y) Origin: US						Food preferences	C	Bell, 2006 ¹⁴
	Anliker's Qx						Food preferences	C	Anliker, 1991

Name of the tool / Country of origin / Translation	Scales					References	
	Age range with validity data (gray filling)						Quality rating ¹
	<1y	1y	2y	3y	4y		
Origin: US						15	
Cooke's Qx Origin: UK					Food preferences	C Cooke, 2005 ¹⁶	
Caporale's Qx Origin: Italy					Food preferences	B Caporale, 2009 ¹⁷	
Perry's test Origin: US					Food preferences	B Harvey-Berino, 1997 ⁸²	
Guthrie's test Origin: UK					Food preferences	C Guthrie, 2000 ⁸³	
Interactive F&V preference measure Origin: US					Food preferences	B Jaramillo, 2006 ⁸⁴	
Maternal Feeding Attitude Origin: Canada Translation: Spanish French					Pushier feeding attitude (10): extent to which parents pressure children to consume foods	C Kramer, 1983 ⁵¹	
Restricted-Access Questionnaire Origin: US					Restriction (10 per snack, 10 snacks): parental attempt to control their child's eating by restricting access to foods	B+ Fisher, 1999 ⁵⁰ Fisher, 2000 ⁸⁵ Birch, 2000 ²⁸	
Child's perception Restricted Access Origin: US					Restriction (3 per snack, 10 snacks): child's perception of parental attempt to control their child's eating by restricting access to foods	B Fisher, 1999 ⁵⁰	
Kid's Child Feeding Questionnaire Origin: US					Pressure to eat (7): extent to which parents pressure children to consume foods Restriction (7): parental attempt to control their child's eating by restricting access to foods	B Carper, 2000 ⁸⁶ B-	

Parental feeding practices

Name of the tool / Country of origin / Translation	Scales						References		
	Age range with validity data (gray filling)							Quality rating ¹	
	<1y	1y	2y	3y	4y	5y			
Infant Feeding Questionnaire Origin: US							Concern about under-eating (4): parental worry about infant unde-reading or becoming underweight	C	Baughcum, 2001 ¹⁹
							Concern about hunger (3): parental use or cereal in the bottle for the infant to be full longer	C	
							Awareness of infant's cues (4): parental and infant sensitivity to infant satiety and hunger cues	C-	
							Concern about overeating (3): parental worry about infant overeating or overweight	C-	
							Feeding on schedule (2): parental control of feeding times	C-	
							Using food to calm (2): use of food to calm infant's fussiness	C-	
							Social interaction during feeding (2): parental attitude during feeding	C-	
Preschool Feeding Questionnaire Origin: US							Difficulty in feeding (6): child perceived as poor or selective eater, or with bad behaviour at mealtime	C+	Baughcum, 2001 ¹⁹ Seth, 2007 ⁸⁷
							Concern about overeating (7): parental worry about child overeating or overweight	C+	
							Pressure to eat (5): extent to which parents pressure children to consume foods	C	
							Using food to calm (4): use of food to calm child's emotions	C-	
							Concern about underweight (2): parental worry about child undereating or underweight	C-	
							Child's control (3): child control over its own eating	C-	
							Feeding interactions (3): child's watching TV at mealtimes, mealtime routine, meals with parents	C-	

Name of the tool / Country of origin / Translation	Scales					References		
	Age range with validity data (gray filling)						Domains (no. of items): short description	Quality rating ¹
	<1y	1y	2y	3y	4y 5y			
						Age-inappropriate feeding (2): bottle-feeding and parents feeding the child	C-	
Parenting Feeding Style Questionnaire Origin: UK						Control over feeding (9): child control over its own eating	B+	Wardle, 2002 ⁸⁸
						Prompting to eat (8): verbal encouragement of the child to eat foods	B	Powers, 2006 ²
						Emotional feeding (5): use of food to regulate child's emotion	B	Clark, 2008 ⁸⁹
						Instrumental Feeding (4): use of food to reward good behaviour	B	
Control over child feeding Origin: Australia						Food rules (2): existence of absolute family rules about eating		Tiggermann, 2002 ⁹⁰
						Monitoring (5): monitoring of child's food eating and encouragement of healthy eating	C-	
Food parenting practices Origin: Belgium						Permissiveness/restriction rules (4): child ability to have sweet or soft drinks whenever he wants	C	Vereecken, 2004 ⁹¹
						Pressure (5): extent to which parents pressure children to consume foods	C	
						Encouragement through material reward (3): use of reward to push child to eat	C	
						Verbal praise (2): praise the child if he/she eats fruit or vegetables	C	
						Encouragement through negotiation (5): encourage the child at least to taste the food	C	
					Encouragement fruit through rationale (4): encouragement to eat fruit based on health benefits of fruit	C		

Name of the tool / Country of origin / Translation	Scales					References	
	Age range with validity data (gray filling)						Quality rating ¹
	<1y	1y	2y	3y	4y 5y		
					Encouragement vegetables through rationale (4): encouragement to eat vegetables based on health benefits of vegetables	C	
					Discouragement sweets through rationale (5): discouragement to eat sweets based on unhealthy effects of sweets	C	
					Discouragement soft drinks through rationale (5): discouragement to eat soft drinks based on unhealthy effects of soft drinks	C	
					Catering on child's demand (4): take into account child's preferences when cooking	C	
					Avoiding negative modeling behavior (2): limitation of sweets and soft drinks intake in the presence of the child	C	
Caregiver's Feeding Style Questionnaire Origin: US Translation: Spanish German					Demandingness: degree to which parents try to get their child eat, regardless of the type of feeding method they use	B	Hughes, 2005 ²¹
					-Parent-centered strategies (12): directives that promote externalization or control of children's eating through external means	B+	Hughes, 2006 ⁹²
					-Child-centered strategies (7): directives that promote internalization of parental values	B	Hugues, 2007 ⁹³
					Authoritarian: strict obedience to parent and unresponsive to child's needs	B-	O'Connor, 2010 ⁹⁴ Hughes, 2008 ³¹

Name of the tool / Country of origin / Translation	Scales					References	
	Age range with validity data (gray filling)						Quality rating ¹
	<1y	1y	2y	3y	4y		
					Authoritative: encouragement for child to express independence, clear set of boundaries, open communication Permissive: few parental boundaries	B B-	
Parental Control Index Origin: UK					Parental control (5): parental use of restriction and pressure to eat to control their child's eating	C- Wardle, 2005 ²⁴	
Family Environment Questionnaire Origin: Australia					Perceived adequacy of child's eating (6): child's fruit and vegetables intake perceived as sufficient and varied by parents Modeling (5): adults and children eat together Restriction (6): parental attempt to control their child's eating by restricting access to foods Monitoring (2): parents keep track of the snack or high fat foods Food availability (4): fresh products easy to buy in the family area Pressure to eat (4): extent to which parents pressure children to consume foods Confidence in cooking (3): parents confident and enjoy cooking Cost and preference for fruit and vegetable (4): parents do not buy fruit or vegetables because of cost or family dislike Mealtime interruption (3): use of television or phone at mealtime	C C C C C C C C- C C- C	Campbell, 2006 ⁷⁶
Overt-Covert Control Origin: UK					Overt control (5): controlling food intake in a way that can be detected by the child	B+ Ogden, 2006 ⁵⁴	

Name of the tool / Country of origin / Translation	Scales					References		
	Age range with validity data (gray filling)						Domains (no. of items): short description	Quality rating ¹
	<1y	1y	2y	3y	4y 5y			
						Covert control (5): controlling food intake in a way that can not be detected by the child	B+	Brown, 2008 ²³
Response To Food Refusal Origin: UK						Response to food refusal (5): examine how mothers responded when their child would not eat a meal	C-	Wright, 2006 ⁴⁸
Comprehensive Feeding Practices Questionnaire Origin: US Translation: French						Child control (5): B147	C	Musher-Eizenman, 2007 ⁵² Musher-Eizenman, 2009 ⁹⁵
						Emotion regulation (3): use of food to regulate child's emotion	C+	
						Encourage balance/variety (4): encouragement of the child to eat, healthy and varied foods	C	
						Food environment (4): lot of healthy foods and few snack foods or sweets available at home	C	
						Food as reward (3): parental use of food to favorise good behaviour or action of their child	C-	
						Involvement (3): child involed in planning and preparation of meals	C	
						Modeling (4): parent try to model healthy eating	C+	
						Monitoring (4): parents keep track of the snack, high fat or sweet foods	C+	
						Pressure (4): extent to which parents pressure children to consume foods	C	
					Restriction for health (4): parental attempt to control their child's eating by restricting access to foods	C+		
					Restriction for weight (8): parental attempt to control their child's eatingand control weight by restricting access to foods	C+		
					Teaching nutrition (3): parent explain the nutritional value of foods	C-		

Name of the tool / Country of origin / Translation	Scales					References	
	Age range with validity data (gray filling)						Quality rating ¹
	<1y	1y	2y	3y	4y 5y		
Feeding Demand Questionnaire Origin: US					Feeding demand full score: extend to which parents endorse demand or control cognitions regarding feeding relations with their children	B	Faith, 2008 ⁹⁶
					Food type demandingness (2): demand cognitions with respect to the kind of food eaten	C	
					Food amount demandingness (2): demand cognitions with respect to the amount of food eaten	C	
					Anger/Frustration (4): parent anger or frustration when the child does not eat the kind or amounts of food planned by the parent	C	
Parent Mealtime Action Scale Origin: US					Snack limits (3): parental limitation of child's intake of sweets, sodas and salty snacks	C	Hendy, 2009 ³⁸
					Positive persuasion (4): parents explain that the food taste good and will make the child healthy	C	
					Daily fruit and vegetable availability (3): the child receive a fruit each day and parents eat fruit and vegetables each day	C	
					Use of rewards (4): parents give rewards to the child for eating and reward good behaviour by offering a favorite food	C-	
					Insistence on eating (3): parents insist the child eat even if not hungry, not feeling well or emotionally upset	C-	
					Snack modeling (3): parents eat sweets or salty snacks each day	C-	
					Special meals (4): a special meal is prepared for the child, different from the family meal	C-	
					Fat reduction (3): parental limitation of fat intake	C-	

Name of the tool / Country of origin / Translation	Scales					References	
	Age range with validity data (gray filling)						Quality rating ¹
	<1y	1y	2y	3y	4y 5y		
					Many food choices (4): child's control over its own eating	C-	
Parental Feeding Dimension Questionnaire Origin: Australia					Supportiveness (10): parent's expression of affection, kindness, enjoyment, regard, and support within the food domain and parent support to her/his child to make good decisions about eating by providing appealing options	C	Joyce, 2009 ⁹⁷
					Structure (6): parent provides information to his/her child about expectations for behaviour, maintains consistent guidelines, and sets appropriate limits with regard to eating	C	
					Coerciveness (10): parent's overreactivity, irritability, and communication of negative feelings such as disapproval of her/his child's eating behaviour and the extent to which a parent is extremely restrictive and controlling in the feeding domain	C	
					Chaos (6): inconsistent, unpredictable, arbitrary, and/or undependable parenting in the feeding and eating context	C	
Infant Feeding Style Questionnaire Origin: US					Laissez-faire: parent does not limit infant diet quality or quantity and shows little interaction with the infant during feeding		Thompson, 2009
					-Attention (5)	C	
					-Diet quality (6)	C	
					Pressuring: parent is concerned with increasing the amount of food the infant consumes and uses food to soothe the infant		
					-Finishing (8)	C	
				-Cereal (5)	C		

Name of the tool / Country of origin / Translation	Scales					References	
	Age range with validity data (gray filling)						Quality rating ¹
	<1y	1y	2y	3y	4y 5y		
					-Soothing (4)	C	
					Restrictive: parent limits the infant to healthful foods and limits the quantity of food consumed		
					-Amount (4)	C	
					-Diet quality (7)	C	
					Responsive: parent is attentive to child hunger and satiety cues and monitors the quality of the child's diet		
					-Satiety (7)	C	
					-Attention (5)	C	
					Indulgence: parent does not set limits on the quantity or quality of food consumed		
					-Permissive (8)	C	
					-Coaxing (8)	C	
					-Soothing (8)	C	
					-Pampering (8)	C	
Parent-Generated Feeding Practices Origin: US					Teachable moments (5): discussion with child about healthy eating	C-	O'Connor, 2010 ⁹⁴
					Practical methods (9): parental attempt to increase fruit and vegetables intake	C-	
					Firm discipline (4): making the child guilty for not eating fruit and vegetables, insist to sit at the table, not going to play and not having sweets until fruit and vegetables not finished	C-	
					Restriction of junk foods (5): limiting access to sweets and junk foods	C_	
					Enhanced availability/accessibility (10): parental attempt to make fruit and vegetables highly accessible to the child	C-	

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¹ Quality rating: All tools were assessed against three quality criteria: 1/ Assessment of internal consistency: Cronbach's $\alpha \geq 0.7$; 2/ Assessment of test-retest reliability: correlation's coefficient ≥ 0.7 ; 3/ Assessment of construct validity: correlation with another measurement of the same construct ≥ 0.4 . Tools were classified as C, when only one of the criteria was achieved and validity was tested in only one sample, C- when at least one criterion was tested but none achieved, C+ when only one of the criteria was achieved and validity was tested in at least two samples, B when two criteria were achieved and validity was tested in only one sample, B- when two criteria were tested but none achieved, B+ when two criteria were achieved and validity was tested in at least two samples, A when all criteria were achieved and validity was tested in only one sample, A+ when all criteria were achieved and validity was tested in at least two samples.

783 Supplementary table 1. Reliability and validity data available for tools that need further testing

	Name of the tool	Description of validity data				
		Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
Children's eating behavior: qualitative dimensions	Children Eating Behavior Inventory	Archer, 1991 ⁴²	Observational 2-12y, n=266	By family composition: 2 parents, ≥ 2 children: 0.76; 2 parents, 1 child: 0.71; 1 parent, 1 child: 0.76; 1 parent, ≥ 2 children: 0.58		Subsample, n=38, 4-6 weeks later Total score: 0.87
	Children Food Neophobia Scale from Pliner	Pliner, 1994 ⁴³	Experimental 5-11y, n=117		Association with willingness ratio to test familiar/unfamiliar foods: 0.38	
		Cooke, 2004 ⁵⁸ Wardle, 2005 ²⁴	Observational 2-6y, n=564	Neophobia: 0.84		
		Russell, 2008 ⁶⁸	Observational 2-5y, n=371	Neophobia: 0.91		
	Behavioral Pediatrics Feeding Assessment Scale	Crist, 1994 ⁶⁹	Observational 1-7y, n=42	Total score: 0.88; Child score: 0.84; Parent score: 0.74		Subsample: n=38, 2-y later Total score: 0.85; Child score: 0.82; Parent score: 0.83
		Crist, 2001 ⁷⁰	Observational 9mo-7y, n=345	Total score: 0.76		
	Questionnaire from Galler	Galler, 1998 ⁴⁷	Observational 7wk-6mo, n=226	Armor thetas: Preference for breastfeeding: 0.75; Father helps: 0.57; Feeding intensity: 0.45; Relatives help: 0.41; Feeding difficulty: 0.37		

Name of the tool	Description of validity data				
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
Satiety Scale	Faith, 2002 ⁴¹	Experimental 4-6y, n=20			Test-retest 2 different days Same of adjacent figure hunger situation: 65%; partial situation: 50%; satiety situation: 90%
Children Food Neophobia Scale from MacNicol	Brown, 2008 ²³	Observational 4-7y, n=518	Neophobia: 0.88		
modified Dietary Restraint scale	Shunk, 2004 ⁴⁶	Observational 5y, n=153	at 5y: 0.64	Correlation with dieting: 0.12	
Food Neophobia Scale from Nicklaus	Nicklaus, 2005 ⁴⁴	Observational 4-22y, n=339	Neophobia: 0.86		
Questionnaire from Wright	Wright, 2006 ⁴⁸	Observational 6wk-12mo, n=826	Avoidant eating behavior: 0.75 at 1y; Response to food refusal: 0.38 at 8mo and 0.33 at 1y		
	Wright, 2007 ⁷¹	Observational 30mo, n=455		Avoidant score higher in children with feeding problems (p<0.0001)	
Feeding Problem Questionnaire from de Moor	de Moor, 2007 ⁷²	Observational 416, n=1.5-3y	Pickiness: 0.78; Disturbing mealtime: 0.61		

Name of the tool	Description of validity data					
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³	
Baby Eating Behavior Questionnaire	Llewellyn, 2010 ³⁷	Observational 8mo, n=2402 families	Enjoyment of food: 0.81; Food responsiveness: 0.79; Satiety responsiveness: 0.73; Slowness in eating: 0.76			
Children's eating behavior: quantitative dimensions	New Zealand Children's Nutrition Survey FFQ	Metcalf, 2003 ⁷³	Observational 1-14y, n=428	Fruit: 0.91; Vegetables: 0.88; Mixed meat dishes: 0.85; Eggs: 0.84; Red meats: 0.90; Chicken: 0.79; Fish: 0.87; Bread: 0.59; Breakfast cereals: 0.75; Rice: 0.87; Spreads: 0.80; Convenience meals: 0.90; Dairy foods: 0.86; Biscuits & cakes: 0.81; Snacks & sweets: 0.84; Milk drinks: 0.82; Non-milk drinks: 0.92		Subsample: n=130, 13 days later Fruit: 0.82; Vegetables: 0.77; Mixed meat dishes: 0.69; Eggs: 0.72; Red meats: 0.81; Chicken: 0.65; Fish: 0.73; Bread: 0.50; Breakfast cereals: 0.70; Rice: 0.77; Spreads: 0.76; Convenience meals: 0.79; Dairy foods: 0.77; Biscuits & cakes: 0.70; Snacks & sweets: 0.79; Milk drinks: 0.71; Non-milk drinks: 0.76
	Anderson's FFQ	Anderson, 2003 ⁷⁴	Observational 1y, n=64		7-d weighted food records: Energy: 0.43; Protein: 0.57; Total fat: 0.56; Total carbohydrate: 0.25; Data also available by food groups	

Name of the tool	Description of validity data				
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
Klohe's FFQ for a tri-ethnic population	Klohe, 2005 ⁷⁵	Observational 1-3y, n=52		3-day diet record Bread/Cereals: 0.40; Dairy: 0.51; Fats/Sweets: 0.33; Fruits: 0.40; Meats: 0.33; Soup: 0.36; Beverages: 0.69; Starchy vegetables: 0.10; Other vegetables: 0.57	Subsample: n=25 Bread/cereals: 0.58; Dairy: 0.63; Fats/Sweets: 0.63; Fruits: 0.79; Meats: 0.71; Soup: 0.53; Beverages: 0.74; Starchy vegetables: 0.74; Other vegetables: 0.84
Hammond's FFQ	Hammond, 1993 ¹²	Observational 5-11y, n=272		14 daily recalls agreement to within ± 1 day per week between frequencies reported in the two methods ranged from 99.8% to 46.8%	
Campbell's FFQ	Campbell, 2006 ⁷⁶	Observational 5-6y, n=560			Subsample: n=54, 3-4 weeks later Energy: >0.80; high-energy fluids: >0.80; sweet snack: >0.80; vegetables: >0.80; Savory snacks: 0.56
Davies's Dietary record	Davies, 1994 ¹³	Observational 1-5y, n=93		Correlation with energy expenditure: 0.41	
Young Children's Nutrition Assessment on the Web	Vereecken, 2009 ⁷⁷	Observational 3.5y, n=862		Food dairies (n=39) vs Web tool (n=217) No significant differences between both groups for nutrient intake and food groups intakes, except water	

Name of the tool	Description of validity data				
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
Saint Louis University for Kids FFQ	Linneman, 2004 ⁷⁸ Haire-Joshu, 2008 ⁷⁹	Observational 2-5y, n=61		Observed intake Lettuce: 0.68; Tomatoes: 0.57; Carrots: 0.81; Broccoli: 0.74; Grapes: 0.65; Peaches: 0.79; Raisins: 0.05; Apple juice: 0.17	Subsample fruit and vegetables intake: 0.82
Huybrechts's FFQ	Huybrechts, 2006 ⁸⁰	Observational 2-7y, n=509		3-d diet records Calcium: 0.52	Subsample, n=60, 5 weeks later Calcium: 0.79
Dietary Fat Questionnaire	Dennison, 2000 ⁸¹	Observational 2-5y, n=91	Total fat: 0.43; Saturated fat: 0.59; Dietary cholesterol: 0.66	4-d dietary records Total fat: 0.54; Saturated fat: 0.44; Dietary cholesterol: 0.55	Subsample: n=51 Total fat: 0.41; Saturated fat: 0.66; Dietary cholesterol: 0.64
Bell's Qx (3.5y-4.5y)	Bell, 2006 ¹⁴	Experimental 3.5-4.5y, n=65		Maternal report: Black olives: 0.86; Cucumber: 0.76; Red pepper: 0.43; Carrots: 0.65; Raw broccoli= 0.41	
Anliker's Qx	Anliker, 1991 ¹⁵	Experimental 5-7y, n=34	Each item used twice, correlation between 2 ratings: Cottage cheese: 0.55; Green beans: 0.72; Cabbage: 0.70; Turnip: 0.56; Orange: 0.52		

Name of the tool	Description of validity data				
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
Cooke's Qx	Cooke, 2005 ¹⁶	Observational 4-16y, n=1291	Fatty & sugary foods: 0.86; Fruit: 0.88; Starchy staples: 0.75; Meat: 0.77; Processed meat: 0.77; Eggs: 0.86; Fish: 0.63; Dairy foods: 0.75; Vegetables: 0.89		
Caporale's Qx	Caporale, 2009 ¹⁷	Observational 4-5y; n=71		Parental report of hedonic responses: -0.92	2 months later pasta with tomato: 0.99; potato puree: 0.37; buttered spinach: -1
Perry's test	Harvey-Berino, 1997 ⁸²	Experimental 4-9y, n=143		Correlation with children choice: 0.71	other sample: n=100 food preferences: 0.91
Guthrie's test	Guthrie, 2000 ⁸³	Experimental 3-5y, n=96			7-14 days later Testing: 0.81; Photographs: 0.75; Plastic: 0.52
Interactive F&V preference measure	Jaramillo, 2006 ⁸⁴	Observational 3-5y, n=50	Fruit and vegetables preferences: 0.87; Fruit preference: 0.77; Fruit juice preference: 0.58; Vegetables preference: 0.82		7 days later Fruit and vegetables preferences: 0.73
Parental feeding practices	Maternal Feeding Attitude	Kramer, 1983 ⁵¹	Observational 3days, n=50		1 day later intra-class r=0.95
	Restricted-Access Questionnaire	Fisher, 1999 ⁵⁰	Experimental 3-6y, n=70	Restriction: 0.87	Correlation with child report: 0.02 in boys, 0.58 in girls

Name of the tool

Description of validity data

	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
	Fisher, 2000 ⁸⁵	Observational 4-6y, n=197	Restriction: 0.81-0.83	Correlation with girl report: 0.18	
	Birch, 2000 ²⁸				
Child's perception Restricted Access	Fisher, 1999 ⁵⁰	Experimental 3-6y, n=70	Restriction: 0.73	Correlation with maternal report: 0.02 in boys, 0.58 in girls	
Kid's Child Feeding Questionnaire	Carper, 2000 ⁸⁶	Observational 4-6y, n=197	Pressure to eat: 0.71; Restriction: 0.60	Association with parental report: Pressure: OR=1.5[1.0-2.1]; Restriction: not significant but data not shown	
Infant Feeding Questionnaire	Baughcum, 2001 ¹⁹	Observational 1-2y, n=435	Concern undereating: 0.71; Concern hunger: 0.74; Awareness of cues: 0.65; Concern overeating: 0.55; Feeding on schedule: 0.48; Using food to calm: 0.44; Social interaction: 0.24		
Preschool Feeding Questionnaire	Baughcum, 2001 ¹⁹	Observational 2-5y, n=633	Difficulty in feeding: 0.87; Concern overeating: 0.83; Pressure to eat: 0.70; Using food to calm: 0.68; Concern underweight: 0.69; Child's control: 0.50; Feeding interactions: 0.37; Age-inappropriate feeding: 0.18		

Name of the tool

Description of validity data

	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
	Seth, 2007 ⁸⁷	Observational 1-5y, n=235	Concern about weight: 0.87; Difficulty in feeding: 0.80; Concern about overeating: 0.72; Using food to calm: 0.68; Pressure to eat: 0.64; Use of rewards: 0.51; Child's control: 0.40; Unstructured mealtimes: 0.20; Use of bottle: 1 item		
Parenting Feeding Style Questionnaire	Wardle, 2002 ⁸⁸	Observational 4-5y, n=214	Control: 0.77; Prompting: 0.69; Emotional feeding: 0.65; Instrumental feeding: 0.85		Subsample: n=166, 2 weeks later Control: 0.83; Prompting: 0.76; Emotional feeding: 0.76; Instrumental feeding: 0.82
	Powers, 2006 ²	Observational 2-5y, n=296	Control: 0.68		
	Clark, 2008 ⁸⁹	Observational 4-11y, n=210	Control: 0.76; Prompting: 0.75; Emotional feeding: 0.77; Instrumental feeding: 0.55		
Control over child feeding	Tiggermann, 2002 ⁹⁰	Observational 5-8y, n=89	Monitoring: 0.69		
Food parenting practices	Vereecken, 2004 ⁹¹	Observational 2.5-7y, n=316	Permissiveness: 0.71; Pressure: 0.74; Material reward: 0.75; Verbal praise: 0.94; Negotiation: 0.71; Rationale for fruit: 0.81; Rationale for vegetables: 0.86;		

Name of the tool	Description of validity data				
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
			Discouragement sweets: 0.80; Discouragement soft drinks: 0.86; Catering on demand: 0.79; Avoiding negative modeling behavior: 0.82		
Caregiver's Feeding Style Questionnaire	Hughes, 2005 ²¹	Observational 3-5y, n=213	Demandingness: 0.85; Parent-centered: 0.86; Child-centered: 0.71		Subsample: n=25, 7-14 days later Demandingness: 0.85; Child-centered: 0.82
	Hughes, 2006 ⁹²				
	Hughes, 2007 ⁹³	Observational 3-5y, n=718	Child-centered: 0.67; Parent-centered: 0.83		
	O'Connor, 2010 ⁹⁴				
	Hughes, 2008 ³¹	Observational 3-5y, n=718	Authoritarian: 0.61; Authoritative: 0.72; Permissive: 0.64		Authoritarian: 0.86; Authoritative: 0.82; Permissive: 0.69
Parental Control Index	Wardle, 2005 ²⁴	Observational 2-6y, n=564	Control: 0.63		

Name of the tool	Description of validity data				
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
Family Environment Questionnaire	Campbell, 2006 ⁷⁶	Observational 5-6y, n=560	Perceived adequacy: 0.89; Modeling: 0.73; Restriction: 0.73; Monitoring: 0.90; Food availability: 0.76; Pressure to eat: 0.75; Confidence in cooking: 0.78; Cost and preference for fruit and vegetable: 0.79; Mealtime interruption: 0.64		
Overt-Covert Control	Ogden, 2006 ⁵⁴	Observational 4-11y, n=297	Overt control: 0.71; Covert control: 0.79	Correlation with CFQ: Restriction-Overt: 0.27; Restriction-Covert: 0.42; Monitoring-Overt: 0.39; Monitoring-Covert: 0.42; Pressure-Overt: 0.46; Pressure- Covert: 0.26	
	Brown, 2008 ²³	Observational 4-7y, n=518	Snack-overt control: 0.76; Meal- overt control: 0.68; Snack-covert control: 0.77; Meal-covert control: 0.80		
Response To Food Refusal	Wright, 2006 ⁴⁸	Observational 4-12mo, n=749	at 8 mo: 0.38; at 12 mo: 0.33		

Name of the tool	Description of validity data				
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
Comprehensive Feeding Practices Questionnaire	Musher-Eizenman, 2007 ⁵²	Observational 3-6y, n=517	Child control: 0.49 (Mothers), 0.70 (Fathers); Emotion regulation: 0.77 (M), 0.78 (F); Encourage balance/variety: 0.60 (M), 0.73 (F); Food as reward: 0.68 (M), 0.66 (F); Modeling: 0.77 (M), 0.84 (F); Monitoring: 0.78 (M), 0.87 (F); Restriction for health: 0.76 (M), 0.69 (F); Restriction for weight: 0.79 (M), 0.82 (F); Teaching nutrition: 0.60 (M), 0.67 (F)		
		Observational 4-8y, n=152	Child control: 0.69; Emotion regulation: 0.74; Encourage balance/variety: 0.58; Food environment: 0.75; Food as reward: 0.69; Involvement: 0.77; Modeling: 0.80; Monitoring: 0.81; Pressure: 0.79; Restriction for health: 0.81; Restriction for weight: 0.70; Teaching nutrition: 0.68		

Name of the tool

Description of validity data

	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
	Musher-Eizenman, 2009 ⁹⁵	Observational 4-6y, n=122	Child control: 0.67 (M), 0.61 (F); Emotion regulation: 0.53 (M), 0.83 (F); Encourage balance/variety): 0.65 (M), 0.68 (F); Food as reward: 0.57 (M), 0.66 (F); Modeling: 0.74 (M), 0.78 (F); Monitoring: 0.85 (M), 0.85 (F); Restriction for health: 0.71 (M), 0.65 (F); Restriction for weight: 0.85 (M), 0.80 (F); Teaching nutrition: 0.54 (M), 0.56 (F)		
Feeding Demand Questionnaire	Faith, 2008 ⁹⁶	Experimental 3-7y, n=85	Full score: 0.81; Food type: 0.70; Food amount: 0.86; Anger/Frustration: 0.86	Correlation of the full score with CFQ: Monitoring: 0.36; Restriction: 0.10; Pressure to eat: 0.53	
Parent Mealtime Action Scale	Hendy, 2009 ³⁸	Observational preschool to elementary school, n=2549	Snack limits: 0.84; Positive persuasion: 0.75; Daily fruit and vegetable availability: 0.70; Use of rewards: 0.65; Insistence on eating: 0.68; Snack modeling: 0.54; Special meals: 0.45; Fat reduction: 0.59; Many food choices: 0.42		
Parental Feeding Dimension Questionnaire	Joyce, 2009 ⁹⁷	Observational 4-8y, n=247	Supportiveness: 0.81; Structure: 0.72; Coerciveness: 0.92, Chaos: 0.80		

Name of the tool	Description of validity data				
	Reference	Study design	Internal consistency ¹ : Cronbach's α	Construct validity ²	Test-retest reliability ³
Infant Feeding Style Questionnaire	Thompson, 2009 ⁴⁹	Observational 3-18mo, n=150	H coefficient: Laissez-faire: Attention:0.80; Diet quality: 0.91 Pressuring: Finishing: 0.79; Cereal: 0.78; Soothing: 0.84 Restrictive: Amount: 0.75; Diet quality: 0.85 Responsive: Satiety: 0.92; Attention: 0.84 Indulgence: Permissive: 0.82; Coaxing: 0.89; Soothing: 0.87; Pampering: 0.94		
Parent-Generated Feeding Practices	O'Connor, 2010 ⁹⁴	Observational 3-5y, n=755	0.41-0.58		

784 ¹Internal consistency: a measure of the extent to which items in a questionnaire (sub)scale are correlated

785 ²Construct validity: correlation with another measurement of the same or similar constructs

786 ³Test-retest reliability: correlation between two assessments 1-4 weeks apart