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The Child Food Rejection Scale: Development and validation of a new scale to assess food neophobia and pickiness among 2- to 7-year-old French children

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Published on: 01 Mar 2017 - European Review of Applied Psychology-revue Europeenne De Psychologie Appliquee (Elsevier Masson)

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Camille Rioux, Jérémie Lafraire, Delphine Picard. The Child Food Rejection Scale: Development and validation of a new scale to assess food neophobia and pickiness among 2- to 7-year-old French children. *European Review of Applied Psychology / Revue Européenne de Psychologie Appliquée*, Elsevier, 2017, 67 (2), pp.67 - 77. 10.1016/j.erap.2017.01.003 . hal-01763570

HAL Id: hal-01763570

<https://hal.archives-ouvertes.fr/hal-01763570>

Submitted on 2 May 2018

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1 **The Child Food Rejection Scale: development and validation of a**
2 **new scale to assess food neophobia and pickiness among 2- to 7-**
3 **year-old French children**

4

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12

13 **Abstract**

14 **Introduction.** The two strongest obstacles to extend children's
15 consumption of fruit and vegetables are food neophobia and pickiness,
16 assumed to be the main kinds of food rejection in children. Accordingly,
17 psychometric tools that provide a clear assessment of these kinds of food
18 rejections are greatly needed.

19 **Objective.** To design and validate a new scale for the assessment of
20 food neophobia and pickiness, thus filling a major gap in the
21 psychometric assessment of food rejection by French children.

22 **Method.** We concentrated on French children aged 2-7 years, as no
23 such scale exists for this young population, and on the two known
24 dimensions of food rejection, namely food neophobia and pickiness, as
25 the nature of the relationship between them is still unclear. The scale was
26 tested on two samples ($N_1=168$; $N_2=256$) of caregivers who responded
27 for their children. Additionally, a food choice task was administered to 17
28 children to check the scale's predictive validity

29 **Results.** The resulting scale, called the Child Food Rejection Scale
30 (CFRS), included six items relating to food neophobia and five items
31 relating to pickiness. A factor analysis confirmed the two-dimensional
32 structure of the scale. Internal consistency, test-retest reliability, and
33 convergent and discriminant validity were all satisfactory. Moreover,
34 results from the food choice task showed that scores on the CFRS
35 accurately predicted children's attitudes toward new and familiar foods.

36 **Conclusion.** Taken together, these findings suggest that the CFRS, a
37 short and easy-to-administer scale, represents a valuable tool for
38 studying food rejection tendencies in French children.

39 *Keywords:* Questionnaire development, Children, Food neophobia,
40 Pickiness, Validation

41

42 **L'échelle de rejets alimentaires pour enfant: développement et**
43 **validation d'une nouvelle échelle pour mesurer la néophobie et la**
44 **sélectivité alimentaire chez les jeunes enfants français de 2 à 7 ans.**

45

46 **Résumé**

47 **Introduction.** La néophobie et la sélectivité alimentaire, responsables
48 d'une réduction de la variété du régime alimentaire, sont présentées
49 comme les deux facteurs principaux des rejets alimentaires chez les
50 enfants. Par conséquent, afin de pouvoir étudier ces formes de rejets, il
51 est important de disposer d'outils robustes permettant de les mesurer.

52 **Objectif.** Développer et valider une nouvelle échelle pour évaluer la
53 néophobie et la sélectivité alimentaire, comblant ainsi une lacune
54 importante dans l'évaluation psychométrique des rejets alimentaires chez
55 les enfants français.

56 **Méthode.** Nous nous sommes concentrés sur les enfants français âgés
57 de 2 à 7 ans, comme il n'existe pas d'échelle pour cette jeune population,
58 et sur les deux dimensions connues des rejets alimentaires, à savoir la

59 néophobie et la sélectivité alimentaire, comme la nature de leur relation
60 est encore inconnue. L'échelle a été testée sur deux échantillons (n1 =
61 168; n2 = 256) de parents qui ont répondu pour leurs enfants. De plus,
62 une tâche de choix d'aliments a été administrée à 17 enfants pour vérifier
63 la validité prédictive de l'échelle.

64 **Résultats.** L'échelle finale, appelée *échelle de rejets alimentaires pour*
65 *enfant* (CFRS), comprend six questions relatives à la néophobie
66 alimentaire et cinq relatives à la sélectivité. Une analyse factorielle a
67 confirmé la structure bidimensionnelle de l'échelle. La cohérence interne,
68 la fiabilité temporelle et la validité convergente et discriminante sont
69 satisfaisantes. De plus, les résultats de la tâche de choix ont montré que
70 les scores à la CFRS prédisent avec précision les attitudes des enfants à
71 l'égard des aliments nouveaux et familiers.

72 **Conclusion.** Les résultats suggèrent que la CFRS, une échelle courte et
73 facile à administrer, représente un outil adapté pour l'étude des rejets
74 alimentaires chez les jeunes enfants français.

75 *Mots-clés:* Développement de questionnaire, Enfant, Néophobie
76 alimentaire, Sélectivité, Validation

77

78 **Introduction**

79 Despite increasing wealth and purchasing power in the Western
80 world, there is an alarming deterioration in dietary habits, including the
81 increased consumption of foods rich in saturated fatty acids at the
82 expense of foods rich in fibers, vitamins and minerals, such as fruit and
83 vegetables (Carruth, Skinner, Houck, Moran, Coletta, & Ott, 1998;
84 Cashdan, 1998; Jacobi, Agras, Bryson, & Hammer, 2003). Indeed there
85 is a wide gap between recommended intake and actual consumption of
86 fruit and vegetables (Cockroft, Durkin, Masding, & Cade, 2005; WHO,
87 2003). The two strongest obstacles to extend children's intake of fruit and
88 vegetables are *food neophobia* and *pickiness*, assumed to be the main

89 kinds of food rejection in children (Birch & Fisher, 1998; Dovey, Staples,
90 Gibson, & Halford, 2008; Falciglia, Couch, Gribble, Pabst, & Frank,
91 2000). Accordingly, psychometric tools that provide a clear assessment
92 of food neophobia and pickiness are greatly needed as they are
93 important to the study of childhood food habits and the effectiveness of
94 interventions or programs designed to expand children's intake of fruit
95 and vegetables. In the present paper, we describe how we developed
96 and validated a new and much-needed scale to assess the food
97 neophobia and pickiness dimensions of food rejection in young children.

98 *Food neophobia* is defined as a fear of new food, (Pliner &
99 Hobden, 1992) and appears as children become mobile, but there is a
100 contention in the literature as to whether it increases thereafter (Birch,
101 McPhee, Soba, Pirok, & Steinberg, 1987; Cashdan, 1994; Harpers &
102 Sanders, 1975) or remains stable during early childhood (Adessi,
103 Galloway, Visalberghi, & Birch, 2005; Cooke, Wardle, & Gibson, 2003;
104 Koivisto & Sjöden, 1996). In 1992, Pliner and Hobden (1992) designed
105 the Food Neophobia Scale (FNS), which ask adult to specify the extent to
106 which they approve or not ten declarations about eating practices, like "If
107 I don't know what is in a food, I won't try it". Originally devised to
108 measure adults' neophobia, the FNS was subsequently adapted to
109 assess children's neophobia (Children Food Neophobia Scale, CFNS;
110 Pliner, 1994). Both of Pliner's scales have since been widely used to
111 measure food neophobia, adapted and translated into several languages,
112 including French (Adapted Food Neophobia Scale; Reverdy, Chesnel,
113 Schlich, Köster, & Lange, 2008) and Italian (Italian Children Food
114 Neophobia Scale; Laureati, Bergamaschi, & Pagliarini, 2015).

115 *Food pickiness* is characterized as a rejection of a certain amount
116 of familiar and new foods to children (Birch, Johnson, Andresen, &
117 Peters, 1991; Galloway, Fiorito, Lee, & Birch, 2005; Smith, Roux, Naidoo,
118 & Venter, 2005; Taylor, Wernimont, Northstone, & Ematt, 2015).

119 Pickiness also includes the intake of inadequate quantities of food
120 (Rydell, Dahl, & Sundelin, 1995), or may relate to the rejection of certain
121 food textures (Smith et al., 2005). A contention concerns the
122 developmental path of pickiness (Taylor et al., 2015). According to
123 Dubois, Farmer, Girard, Peterson, and Tatone-Tokuda (2007) the
124 prevalence of pickiness remains relatively stable during early childhood
125 (2.5-4.5 years), whereas a recent longitudinal study by Mascola, Bryson,
126 and Agras (2010) showed that the highest prevalence of pickiness arises
127 in toddlerhood, and subsequently decreases to very low levels by the age
128 of 6 years. A further contention exists concerning the relationship
129 between food pickiness and neophobia. In their review, Dovey et al.
130 (2008) supposed that the two constructs are behaviorally distinct, as
131 dissimilar factors foresee their extend and manifestation. However, other
132 researchers have argued that these two kind of food rejections are
133 undoubtedly linked (Potts & Wardle, 1998; Raudenbush, van der Klaauw,
134 & Frank, 1995) or even indistinguishable (Wardle, Guthrie, Sanderson, &
135 Ropoport, 2001). Up to now, a controversy exists concerning the
136 relationship between food pickiness and neophobia, which arguably can
137 be partly explained because there is clearly still some confusion
138 surrounding the very concept of pickiness (Potts & Wardle, 1998; Taylor
139 et al., 2015). While neophobia is usually assessed through Pliner's
140 scales (Pliner & Hobden, 1992; Pliner, 1994) or adapted versions, there
141 is no such widely recognized scale for pickiness measurement. It has
142 usually been assessed through various tools such as scales on eating
143 practices that include subscales for pickiness, food neophobia, low
144 enjoyment when eating, and so forth. Notable questionnaires include the
145 Children's Eating Behavior Questionnaire (CEBQ see Wardle et al.,
146 2001; Tharner et al., 2014), and Children's Eating Difficulties
147 Questionnaire (CEDQ see Rigal, Chabanet, Issanchou, & Monnery-
148 Patris, 2012). Other researchers have measured pickiness by merely

149 questioning caregivers if their children are picky (Carruth, Ziegler,
150 Gordon, & Barr, 2004; Jacobi et al., 2003; Jacobi, Schmitz, & Agras,
151 2008).

152 In a recent review of methods to assess preschool children's
153 eating behavior, De Lauzon-Guillain and colleagues (2012) pointed out
154 that most of existing scales measuring children's food neophobia and/or
155 pickiness are not entirely psychometrically sound. Indeed only the French
156 Questionnaire pour Enfant de Neophobie Alimentaire (QENA, Rubio,
157 Rigal, Boireau-Ducept, Mallet & Meyer, 2008) and the CEBQ (Wardle et
158 al., 2001) achieved all validity and reliability criterion (other
159 questionnaires such as the widely used FNS and CFNS failed to validate
160 construct validity and/or temporal reliability). However, the QENA is a
161 self-assessment questionnaire designed to measure neophobia for at
162 least 5 years old children, while it would be of interest to measure
163 neophobia for 2 years old children because it is the onset of food
164 rejections. Additionally, the CEBQ does not differentiate between food
165 neophobia and pickiness, while recent reviews and researches have
166 proposed that they are two latent variables (Dovey et al., 2008; Galloway,
167 Lee, & Birch, 2003; Rigal et al., 2012). Therefore there is a need for
168 further development of tools to measure both neophobia and pickiness
169 as two possible dimensions of food rejections in critical period (2-7 years
170 old) in French toddlers.

171 In the present study, we adapted and validated a new scale for
172 the assessment of food neophobia and pickiness, both thought to be
173 dimensions of food rejection, in young French children. We concentrated
174 on children aged 2-7 years, as no such scale exists for this young
175 population. Moreover, contrary to previous scale measurement, we took
176 special care to assess all aspects of pickiness behaviors and to measure
177 all the properties that would be expected of any psychometric instrument,

178 namely internal consistency, factor structure, discriminant and
179 convergent validity, test-retest reliability, and construct validity (see, for
180 example, De Lauzon-Guillan et al., 2012; Hinkin, 1995; Ritchey, Frank,
181 Hursti, & Tuorila, 2003; Vallerand, 1989). Finally, we believed that
182 designing and testing the validity of a scale that included items on food
183 neophobia and items on pickiness would provide an insight into the
184 (currently obscure) relationship between these two constructs, as well as
185 the (currently opaque) nature of their developmental paths.

186

187 **Preliminary experiment: Item generation and selection**

188 **Method**

189 ***Questionnaire Design.***

190 Our main concern was to propose a short and easy-to-administer
191 scale, all the while ensuring good content validity that is, capturing the
192 two specific constructs (i.e., food neophobia and pickiness) without
193 including any superfluous content. Developing a brief measure is an
194 efficient mean of minimizing participants' fatigue and response biases
195 (Hinkin, 1995). Our objective was to come up with a scale featuring a set
196 of around 10 carefully selected items (i.e., items loading strongly on one
197 of the two assumed dimensions). To this end, we adapted from existing
198 scale and developed more items than necessary for the definitive
199 questionnaire, so that we could reject any items that were potentially
200 inaccurate, recurrent or indistinct, and yet retain an enough figure of
201 items to ensure a reliable tool (Gehlbach & Brinkworth, 2011). To
202 generate these items, we first reviewed the literature, in order to precisely
203 define the two constructs under consideration and assess previous
204 measures (Lafraire, Rioux, Giboreau, & Picard, 2016). We then extracted
205 and adapted 18 items from existing scales that proved to accurately
206 capture the two constructs and predict food rejection behaviors. All items
207 regarding neophobia were adapted from the FNS (Pliner & Hobden,

1992) or the QENA (Rubio et al., 2008) as the first scale is widely used to assess neophobia and the second was proved to be perfectly psychometrically sound. All items regarding pickiness were adapted from the CEBQ (Wardle et al., 2001) and the CEDQ (Rigal et al., 2012) as the first scale is usually used to assess pickiness and the second is a French scale targeting under 5 years old children, thus adapted to the population of the study. Additionally we created 23 additional items based on the definitions of the two constructs. The majority of the additional items concerned pickiness. Indeed, as the review of the literature revealed, while neophobia is a rather well defined construct, there is clearly still some confusion surrounding the very concept of pickiness, and existing scales do not encompass every suspected aspect of this construct (such as the rejection of certain texture). We thus compiled 41 items in total: 20 items relating to food neophobia and 21 items relating to pickiness. We decided to avoid reverse-scored items as this has been shown to diminish scale reliability and possibly introduce systematic errors (Gehlbach & Brinkworth, 2011; Schriesheim & Hill, 1981). Hence, each of the 41 items was a positive sentence, such as “My child is constantly looking for familiar foods”.

To verify that the items we had compiled and generated were clear and fully captured the two constructs, we tested the 41-item questionnaire for cognitive validity (Gehlbach & Brinkworth, 2011; Karabenick *et al.*, 2007). To this end, a pilot study was run with a group of 10 women, either mothers or childminders, recruited from a nursery association in the French city of Lyons. These participants received the questionnaire at home and were asked to indicate whether or not they thought each item was clear and relevant to assess children food rejection behaviors on two separate 5-point Likert-like scales). Afterwards, a collective interview was held on the association’s premises, and questions and comments about the items raised by participants were

238 discussed. Additionally, the women were asked to indicate any other
239 eating behaviors they could think of, displayed by children during
240 mealtimes. Following this interview, six items were removed owing to
241 vagueness and misunderstanding, and none were added, leaving a
242 provisional 35-item questionnaire to be administered and
243 psychometrically analyzed (see Appendix for the 35-item version of the
244 questionnaire).

245 ***Participants and Procedure.***

246 The 35-item questionnaire was administered online to 205
247 parents recruited on food blogs or social networks with no exclusion
248 criteria, who each responded at the time of their convenience for their
249 child aged between 2 and 7 years. None of them had been involved in
250 the preliminary experiment. Parents who were not direct caregivers
251 (n=11) or who did not finish the poll (n=26) were extracted from the
252 study, leaving a first sample N_1 of 168 participants (138 mothers and 30
253 fathers). Caregivers rated each item according to their child's behavior
254 (83 girls and 85 boys aged 23-84 months, mean age = 48 months, $SD =$
255 16) on a 5-point Likert-like scale (*Strongly disagree, Disagree, Neither*
256 *agree nor disagree, Agree, Strongly agree*). This 5-point Likert-like scale
257 was chosen so as to allow for sufficient variance among the participants
258 (Gehlbach & Brinkworth, 2011; Lissitz & Green, 1975). We used verbal
259 anchors, rather than numerical ones, because numbers can have implicit
260 meanings (Gehlbach & Brinkworth, 2011). Each answer was then
261 numerically coded (from *Strongly disagree* = 1 to *Strongly agree* = 5),
262 with a high score indicating high food rejection (scores could range from
263 35 to 175). Participants were informed they will receive a booklet
264 providing nutritional advice and tips for recipes after completion of the
265 survey. This preliminary experiment was performed in adherence with the
266 principles established by the declaration of Helsinki.

267 ***Data Analysis.***

268 For each child, we calculated a food rejection score ranging
269 from 35 to 175, based on the caregiver's answers. Preliminary analyses
270 were ran on these scores to check the normality of the data distribution
271 (Anscombe-Glynn kurtosis test). Then, the mean food rejection scores for
272 each sex were measured and compared (Student's *t* test), and
273 correlations between food rejection scores and children's age were
274 assessed (Pearson correlation coefficient). Finally, we performed an
275 iterative exploratory factor analysis using principal component analysis
276 with promax rotation, to determine the number of dimensions of the scale
277 and select the different items to include in the decisive scale. We set the
278 alpha level at 0.05 for all statistical analyses. All statistical analyses were
279 conducted using R 3.1.2 software, using the packages "psych" and
280 "FactoMineR".

281

282 **Results**

283 ***Preliminary Analysis.***

284 Food rejection scores ranged from 45 to 171 ($M = 97.6$, $SD = 27$).
285 Checks for kurtosis showed that the food rejection scores were
286 distributed normally ($z = 0.81$, $p = 0.41$, *ns*). Then analysis revealed that
287 these scores were not influenced by the gender of either the caregiver (t
288 $= 1.51$, $p = 0.13$, *ns*) or the child ($t = 0.71$, $p = 0.94$, *ns*). Data were
289 therefore computed across these factors in subsequent analyses.
290 Moreover, prior the analysis, we checked the items for sufficient item
291 variability. The majority of items had medium means (between 2 and 4 on
292 the 5-point Likert-like scale), signifying that there were no ceiling and
293 floor effects (Clark & Watson, 1995). Additionally, standard deviations
294 showed satisfactory variation (i.e., $SD > 1$ according to Whitley & Kite,
295 2013). Only three items did not satisfy these criterions, but given this
296 small proportion, we decided to retain them for the factor analysis.

297 ***Iterative Exploratory Analysis and Item Refining.***

298 We run a principal component analysis with promax rotation on
299 the food rejection scores for all 168 respondents' children on the 35-item
300 scale (N_1). The optimal number of factors was assessed with the Kaiser
301 criterion (only the factors with eigenvalues above one are selected;
302 Kaiser, 1960) and Cattell's scree plot criterion (determination of the point
303 where the last important eigenvalues drop appears; Cattell, 1966).
304 Following these two criteria, primary analysis indicated that the
305 optimum number of factors was two, with an eigenvalue of 13.98 for the
306 first factor (explaining 40% of the variance) and an eigenvalue of 3.99 for
307 the second factor (explaining 11% of the variance). The other factors'
308 eigenvalues were close to or below 1. In total 51% of the variance was
309 explained by the two-factor model which had an inter-factor correlation of
310 0.62.

311 Examination of factor loadings showed that the majority of items
312 loaded rather strongly on one underlying factor. However, 15 items
313 proved problematic: Items P1, P7, P9 did not load on the anticipated
314 factor (these three items were extracted from existing tools measuring
315 pickiness and yet loaded on the same latent factor that items supposedly
316 measuring neophobia), Items P2, P8, P11 and N5, had medium loadings
317 on both factors, N8 had extremely low loadings (< 0.1) and the
318 comments made by participants revealed that Items P12-P18 were
319 indistinguishable from items N12-N17 (the participants were not able to
320 distinguish the term *difficile*, translated as *picky*, from the expression *ne*
321 *goûte pas un nouvel aliment*, translated as *won't try a novel food*). We
322 therefore decided to remove these 15 problematic items from the scale
323 (P1, P7, P8, P9, P11-18, N5 and N8). Moreover, the test of internal
324 consistency (Cronbach's alpha coefficient) showed some redundancy
325 between items ($\alpha = 0.96$), and inspection of the correlation matrix
326 confirmed that some items were strongly correlated. Items N14-17 were
327 all removed because they were closely correlated with Item N9 (all

328 Pearson coefficients above 0.62). Items N3 and N11-13 were also
329 removed to ensure a balance between the subscales. Altogether, 24 of
330 the 35 items were removed. We then re-analyzed the data using the new
331 and shortened version (11 items) of the scale.

332 Examination of the second scree plot indicated that it was suitable
333 to extract two factors, with an eigenvalue of 3.77 for the first factor
334 (explaining 34% of the variance) and an eigenvalue of 2.38 for the
335 second factor (explaining 22% of the variance). Therefore, the two-factor
336 model explained 56% of the variance with an inter-factor correlation of
337 0.54. Examination of factor loadings showed that all the items loaded
338 rather strongly on the anticipated factors (see Table 1), and internal
339 consistency was good ($\alpha = 0.87$). We therefore run a confirmatory
340 factorial analysis (CFA) with the 11-item scale and to assess its
341 psychometric properties. The 11- item scale resulting from the iterative
342 exploratory analysis contained 6 items relating to food neophobia and 5
343 items relating to pickiness (all items derived from previous questionnaires
344 for the pickiness subscale were removed during this item refining
345 process).

346

347 --Insert Table 1 about here--

348

349 **Main experiment: Validation of the Questionnaire**

350 **Methods**

351 ***Participants.***

352 The 11-item questionnaire was administered to 274 parents either
353 recruited online on food blogs or social networks, or from schools through
354 flyers posted in the Lyons urban area (France) with no exclusion criteria,
355 who each responded for their child aged between 2 and 7 years. None of
356 them had been involved in the preliminary experiment. Parents who were
357 not direct caregivers (n=3) or who did not complete the entire survey

358 (n=15) were extracted from the study, that left us with a second sample
359 N_2 of 256 caregivers (mainly mothers). As in the preliminary experiment,
360 caregivers rated each item according their child's behavior (130 girls and
361 126 boys aged 22-84 months, mean age = 47 months, $SD = 15$) at the
362 time of their convenience on a 5-point Likert-like scale (*Strongly*
363 *disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree*).
364 Each answer was then numerically coded with a high score indicating
365 high food rejection (scores could range from 11 to 55). Participants were
366 informed they will receive a booklet providing nutritional advice and tips
367 for recipes after completion of the survey. This main experiment was
368 performed in adherence with the principles established by the declaration
369 of Helsinki.

370 ***Convergent and discriminant validity.***

371 In order to assess the scale's convergent and divergent validities,
372 67% of the sample N_2 (172 caregivers) also filled in the Food Attitude
373 Survey (FAS, Frank & van der Klaauw, 1994) and the French version of
374 the Revised Children's Manifest Anxiety Scale (RCMAS; Turgeon &
375 Chartrand, 2003) for their child (the completion to these questionnaires
376 was not mandatory explaining the loss of participants, but caregivers had
377 the choice of filling these additional questionnaires after completion of the
378 first and main questionnaire). The subsample included 85 caregivers of
379 girls and 87 caregivers of boys, and these children were aged between
380 22 and 84 months (mean age = 46 months, $SD = 15$).

381 In the FAS questionnaire, which was successfully translated into
382 French by Ton Lu (1996), adults are questioned to specify the extent to
383 which they approve or not ten declarations about eating practices (e.g., "I
384 find that many foods I like are sweet") on a 5-point Likert-like scale. We
385 selected the FAS to evaluate convergent validity as this questionnaire
386 has been used to measure attitudes toward familiar and new foods, and
387 has been shown to have sound internal consistency (Frank & van der

388 Klaauw, 1994; Raudenbush, Schroth, Reilley, & Frank, 1998). It is
389 worth noting that we could have used the QENA (Rubio et al., 2008) or
390 the CEBQ (Wardle et al., 2001) to assess the convergent validity of our
391 scale as they are entirely psychometrically valid. However we decided to
392 use the FAS because the QENA is a self-assessment questionnaire used
393 to measure only neophobia and the CEBQ was not translated in French
394 and did not distinguish between neophobia and pickiness.

395 In the other hand, the RCMAS asks participants to answer “yes”
396 or “no” to 36 statements about anxiety and low esteem issues, such as “I
397 worry a lot of the time”. We selected this scale to evaluate discriminant
398 validity because although it assesses anxiety and not food rejection, food
399 rejection is sometimes associated with high anxiety toward food items
400 (Galloway et al., 2003). Thus, we expected to find medium to high
401 positive correlation values between FAS scores and food rejection
402 scores, and lower positive correlation values between RCMAS scores
403 and food rejection scores.

404 ***Test-retest reliability.***

405 To evaluate the scale’s reliability, 44% ($n = 74$) of the sample
406 N_1 underwent a retest procedure. These parents twice completed online
407 the 11-item version of the scale with a four-week interval in between (the
408 completion to this second session was not mandatory explaining the loss
409 of participants). The test-retest sample included 37 caregivers of girls
410 and 37 caregivers of boys, and these children were aged between 22
411 and 84 months (mean age = 49.1 months, $SD = 16.8$).

412 ***Predictive value of the questionnaire.***

413 As in the seminal study by Pliner and Hobden (1992), we
414 administered a food choice task to an additional sample of 17 children
415 aged 31-78 months (mean age = 57 months, $SD = 15$) to evaluate the
416 predictive validity of our scale. Children took the test individually in a
417 quiet room during the time of the mid-morning break (which is usually

418 taking place inside the classroom around 10 am) and were led to
419 believe that they would be able to choose that day's menu in their
420 cafeteria. They were told that many foods were available and they had to
421 choose between them. Following the procedure used by Pliner and
422 Hobden (1992), we used color photographs of real foods as the material
423 for the choice test. Eight pairs of food pictures were shown successively
424 to the children (four pairs were designed to measure neophobia and four
425 to measure pickiness, see table 2). These pictures were placed on a
426 plastic plate to remind the children of an eating context.

427 To avoid misleading between food rejection and religious or
428 widespread eating habits such as vegetarianism, we excluded the meat
429 and fish categories. In the one hand each pair measuring neophobic
430 behaviors contained one *a priori* known food and one *a priori* unknown
431 food in the same general category (for example in one pair children had
432 to choose between an apple and a persimmon, see Table 2, line 2), and
433 data collection from the children supported this classification : the
434 participants' mean familiarity ratings (the mean was assessed by
435 attributing a score of 0 when the child told the experimenter he/she did
436 not know the food and 1 when he/she told the experimenter she did know
437 it), averaged across foods, were 0.08 for the four novel foods and 0.72
438 for the four familiar ones. These means were significantly different ($t =$
439 4.03, $p = 0.02$). In the other hand, each pair measuring picky behaviors
440 contained a picture of a classical and familiar canteen dish with the
441 different components sorted and separated from each other and a picture
442 of the same dish but with the different components stirred together (for
443 example in one pair children had to choose between a fruit salad with
444 pears in one side, apples in the other and a fruit salad were apples and
445 pears were mixed together, see table 2, line 2).

446

447 --Insert Table 2 about here--

448

449 For each of the eight pairs (presented in a counterbalanced
450 order), set out in Table 2, the children were asked to choose the member
451 of the pair they were willing to taste later at the canteen. For each
452 participant, a caregiver was required to complete the 11-item scale in
453 order to associate the children's food choice scores with their food
454 rejection scores.

455 ***Data analysis.***

456 For each child, we calculated a food rejection score ranging from
457 11 to 55, based on the caregiver's answers. Preliminary analyses were
458 run on these scores to check if the data were normally distributed
459 (Shapiro's test). Then a confirmatory factor analysis (CFA) was
460 conducted, using the maximum likelihood method. Finally, we conducted
461 psychometric analyses to validate the final short version of the scale.
462 First, we assessed our scale's reliability by calculating its internal
463 consistency (Cronbach's alpha coefficient), and its temporal stability by
464 assessing its test-retest reliability (we compared the mean values
465 obtained for each session with paired Student's *t* test). Second, we
466 assessed our scale's convergent, discriminant and predictive validity
467 (Pearson and Spearman correlation coefficients). Finally, the mean food
468 rejection scores for each sex were measured and compared (Student's *t*
469 test), and correlations between food rejection scores and children's age
470 were assessed (Pearson correlation coefficient). We set the alpha level
471 at 0.05 for all statistical analyses. R 3.1.2 software and LISREL 9.10
472 (Jöreskog & Sörbom, 2012) were used to realize the statistical analyses.

473

474 **Results**

475 ***Preliminary Analysis***

476 Food rejection scores ranged from 11 to 55 ($M = 34.8$, $SD = 8.6$).
477 Results from Shapiro's test indicated that the food rejection scores were

478 normally distributed ($w = 0.99$, $p = 0.38$, ns). Screens for appropriate
479 item variability revealed moderate means (between 2 and 4 on the 5-
480 point Likert-like scale) and sufficient variability ($SD > 1$). Only one item
481 failed to meet this criterion, but given this small proportion, we decided to
482 retain this item for the CFA.

483 **Confirmatory factor analysis (CFA)**

484 We ran a CFA to test the two-factor model's fit to the 11-item
485 scale, using the maximum likelihood method with LISREL 9.10 (Jöreskog
486 & Sörbom, 2012). Items N1, N2, N4, N6, N7 and N10 loaded on the first
487 latent factor, named *food neophobia*, and Items S3, S4, S5, S6 and S10
488 loaded on the second latent factor, named *food pickiness*. Figure 1
489 displays the path diagram yielded by the CFA for the two-factor solution.

490

491 --Insert Figure 1 about here—

492

493 Figure 1 shows satisfactory factor loadings for each latent factor (range:
494 0.42-0.81), and a strong correlation between the two latent factors ($r =$
495 0.76). The CFA yielded acceptable fit indices: goodness-of-fit index (GFI)
496 = 0.958, comparative fit index (CFI) = 0.981, root mean square error of
497 approximation (RMSEA) = 0.041 and $\chi^2/df = 1.42$, as recommended by
498 Wheaton, Muthén, Alwin, and Summers (1977), and Jackson, Gillaspay,
499 and Purc-Stephenson (2009). Thus, the two-factor model was fully
500 relevant. It is worth noting that even if we found strong correlation
501 between food neophobia and pickiness, the two-factor model was more
502 relevant than the one-factor model (which displayed poorer fit indices: GFI
503 = 0.92, CFI = 0.93, RMSEA = 0.076 and $\chi^2/df = 2.47$). We then
504 assessed the psychometric properties of the final 11-item scale.

505 **Internal consistency.**

506 Internal consistency of the final 11-item scale was satisfactory
507 overall (Cronbach's $\alpha = 0.87$), as well as for each subscale ($\alpha = 0.87$ for
508 the neophobia subscale and $\alpha = 0.69$ for the pickiness subscale).

509 ***Convergent and discriminant validity.***

510 Spearman's coefficient indicated that food rejection scores were
511 significantly closely correlated with FAS scores ($r = 0.81, p < 0.001$). This
512 correlation was positive, indicating that a high food rejection score
513 corresponded to a high FAS score. This result attested to the convergent
514 validity of our questionnaire. Additionally, food rejection scores were
515 significantly and positively correlated with RCMAS scores, as indicated
516 by Pearson coefficient ($r = 0.33, p < 0.001$). This correlation was positive,
517 albeit much more moderate, indicating that our scale was discriminantly
518 valid. It should be noted that we observed the same correlation ranges
519 for each subscale (strong correlations between neophobia or pickiness
520 scores and FAS scores respectively .75 and .4, and moderate
521 correlations between neophobia or pickiness scores and RCMAS scores,
522 respectively 0.19 and 0.21).

523 ***Test-Retest reliability.***

524 Table 3 sets out the mean scores at test and retest for the 11-item
525 version of the scale. Statistical analyses indicated that test scores were
526 closely correlated with retest scores (all $r_s > 0.55$). Moreover, variations
527 in the mean rejection scores between test and retest were not significant
528 (all $p_s > 0.5$). Taken together, these findings indicate that the final food
529 rejection scale had satisfactory test-retest reliability.

530

531

532 --Insert Table 3 about here--

533

534 ***Predictive value of the questionnaire.***

535 The degree to which a child behaved in a picky and neophobic
536 manner was defined as the numbers of pairs for which he/she chose the
537 familiar/sorted food for later tasting, divided by the total number of pairs
538 ($N = 8$). Indeed if a child chose the familiar item in the pairs measuring
539 neophobia (ordinary rice, apple, green beans and cow cheese) he/she
540 behaved in a neophobic manner as neophobic children are reluctant to
541 taste novel food items. Additionally, for pairs measuring pickiness if
542 he/she chose the picture were foods were sorted, he/she behaved in a
543 picky manner because picky children often sort their food in the plate.

544 A correlation analysis using Spearman's correlation coefficient
545 across the children indicated that questionnaire scores and children's
546 choice of familiar/sorted foods were significantly correlated ($r = 0.48$, $p =$
547 0.049). This correlation was positive, indicating that a high food rejection
548 score corresponded to a high number of familiar/sorted foods chosen
549 during the task (see Fig. 2).

550 ***Variations in food rejection scores according to children's sex and*** 551 ***age.***

552 Results from mean comparisons using a t test showed that boys
553 and girls did not differ significantly on food rejection scores ($t = 0.67$, $p =$
554 0.49 , ns). We observed the same absence of sex effect for each
555 subscale (both p values > 0.3). Finally, correlation coefficients indicated
556 that neither the neophobia, pickiness nor total food rejection scores were
557 significantly correlated with age (all r s < 0.13 , ns). We also assessed
558 Spearman correlations between age and each of the 11 items, to see
559 whether any item was more closely correlated with age than the others,
560 but results indicated that none of the items were correlated with age (all
561 r s < 0.15).

562

563 **General Discussion**

564 The threefold aim of this study was to (i) validate a new food
565 rejection scale that would simultaneously measure food neophobia and
566 pickiness, thereby filling a gap in the psychometric assessment of food
567 rejection by young French children, (ii) clarify the definition of pickiness
568 and (ii) unpick the relationship between food neophobia and pickiness, as
569 well as the developmental paths of these two constructs. To our
570 knowledge, ours was the first attempt to design a scale that included
571 pickiness and food neophobia as two possible dimensions of food
572 rejection by children, and which had all the properties of a reliable test.

573 First, our findings showed that the final 11-item food rejection
574 scale, which we named the Child Food Rejection Scale (CFRS),
575 displayed good psychometric properties (it important to note that in the
576 final scale, half of the retained items of the neophobia subscale were
577 adapted from the FNS (Pliner & Hobden, 1992), while all the pickiness
578 subscale's retained items were created for this research). Reliability, as
579 measured through internal consistency and test-retest reliability was
580 satisfactory, with coefficients comparable to those found in previous
581 research on children's food neophobia or pickiness when it was
582 measured. For instance, Rubio, and colleagues (2008) reported a
583 Cronbach' alpha of 0.84 and a Pearson coefficient of 0.74 for the
584 test-retest reliability of their neophobia scale, while Rigal and
585 collaborators (2012) reported an alpha of 0.73 for their fussiness
586 subscale (Rubio et al., 2008; Rigal et al., 2012). The construct validity of
587 the CFRS was also adequate, as attested by measures of convergent
588 and discriminant validity. Results further showed that the predictive
589 validity of our scale was satisfactory: using food pictures was an efficient
590 strategy for measuring food choice, as proposed by Guthrie, Rapoport,
591 and Wardle (2000), as well as by Rubio and colleagues (2008). Although
592 significant, the correlations between food rejection scores and food
593 choices were quite moderate. As pointed out by Laureati and colleagues

594 (2015), the use of real food items, might have led to stronger
595 correlations. Nevertheless, to offset the limitations of using of food
596 pictures, we tested the children in an ecological environment, namely the
597 room where they usually have their morning snack, as ecological validity
598 can be achieved with real-world stimuli as well as with natural settings.
599 The correlation obtained within this sample was nevertheless within the
600 range of those previously found by studies assessing the predictive
601 validity of the FNS ($r = 0.43$ in Loewen & Pliner, 2000; $r = 0.43$ in Pliner &
602 Hobden, 1992; $r = 0.34$ in Rubio et al., 2008). It is also interesting to note
603 that these studies used self-assessment questionnaires, whereas we
604 used proxy assessment. Therefore, we can reasonably assume that
605 caregivers are relevant predictors of their children's behaviors toward
606 foods.

607 Second, factor analyses supported the two-dimensional structure
608 of our scale, namely the distinction between food neophobia and
609 pickiness in young children refuting Wardle et al. (2001) position i.e.
610 neophobia and pickiness are indistinguishable. There was, however, a
611 strong positive correlation between these two kinds of food rejection,
612 indicating that they are closely related (i.e., a child with a high neophobia
613 level was likely to display a high pickiness level as well). These findings
614 are in line with the claims of Potts and Wardle (1998), Raudenbush et al.
615 (1995) and Rigal et al. (2012). They also partly explain the view put
616 forward by Dovey and colleagues in their review (2008) that some social
617 factors, such as pressure to eat and parental practices/styles, have
618 similar effects on the severity of expressions of both food neophobia and
619 pickiness. Concerning the developmental paths of food rejection, the
620 pattern we found for food neophobia is consistent with the view put
621 forward by Adessi et al. (2005), Cooke et al. (2003), and Koivisto and
622 Sjöden (1996), that neophobia increases promptly around 2 years of age,
623 when children are liable to ingest poisonous compounds because of their

624 increasing mobility, and remains quite stable until 6-7 years. For
625 pickiness, the absence of changes in its prevalence with age is
626 consistent with the view of Dubois et al. (2007). However, as pointed out
627 by a recent research review of pickiness undertaken by Taylor et al.
628 (2015), consensus on the developmental path of pickiness will only be
629 reached if an agreement on the definition is achieved and assessment
630 across study is undertaken with homogenous and fully validated tools.
631 Finally, we found no evidence that food rejection (either neophobia or
632 pickiness) varied across the sexes in early childhood. This finding is
633 consistent with previous results for sex comparisons in food rejection by
634 young children (see Koivisto-Hursti & Sjöden, 1997, for food neophobia,
635 and Xue et al., 2015, for pickiness), and is particularly noteworthy, for in
636 teenagers, there are generally clear sex differences in attitudes toward
637 food, attributed partly to social factors such as girls' growing concerns
638 about their weight and body image (Wardle et al., 2001). It would hence
639 be interesting to follow the developmental path of sex differences across
640 the years, to better understand the respective roles of cognitive and
641 social factors in food rejection.

642 We acknowledge that there were several limitations to this study.
643 First, the fairly moderate response rate to the questionnaire led us to
644 presume that it was mainly filled in by families interested with nutrition,
645 and hence not entirely representative of the national population. Further
646 studies could thus extend the investigation of children's food rejection
647 assessment to more representative and generalizable samples and to
648 test the applicability of the scale for non-French children. Second, we
649 lacked dual-caregivers reports or children perspective on their own food
650 neophobia and pickiness. Further studies could therefore assess the
651 concordance of caregiver ratings for the same child or the concordance
652 of children and caregiver ratings (for an older child who could answer for
653 their own to the questionnaire). Third, it would seem that the subscale for

654 neophobia is more robust and consistent than that for pickiness which
655 has a lower consistency. Pickiness is a construct which is still not well
656 defined and further studies are much needed to better grasp this
657 construct. Finally, in our food choice task, the food pictures used to
658 measure pickiness were based on only one aspect of this construct
659 (namely that a picky child is likely to sort his/her food), whereas its
660 definition also includes the consumption of an inadequate amount of food
661 or the rejection of certain food textures. In future research, therefore, it
662 would be worth assessing the predictive validity of the CFRS with
663 another feature of picky behaviors (e.g., by presenting children with foods
664 of different textures). Nevertheless, despite these limitations, we believe
665 that the CFRS represents an efficient and valuable tool for studying food
666 rejection tendencies in young French children through their caregivers.
667 This new scale could be useful for measuring the effectiveness of
668 interventions promoting the adoption of healthier food habits, by children.

669

670 **Acknowledgements:** the authors would like to acknowledge the
671 financial support from the Fondation Daniel et Nina Carasso. We are
672 grateful to parents for their helpful collaboration. We would also like to
673 thank E. Wiles-Portier who proofread our article.

674

675 **Conflict of interest:** The authors declare no conflict of interest.

676

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948 Table 1: Descriptive statistics and factor loadings from the exploratory
 949 factor analysis.

Item	Mean	SD	Factor 1	Factor 2
P3. Mon enfant refuse de manger certains aliments à cause de leurs textures (<i>My child refuses certain foods due to their texture</i>)	3.3	1.2	0.14	0.48
P4. Mon enfant fait le tri dans son assiette (<i>My child sorts his/her food on the plate</i>)	3.3	1.2	0.28	0.56
P5. Mon enfant rejette certains aliments après les avoir goûté (<i>My child rejects certain foods after tasting them</i>)	3.9	0.7	0.14	0.75
P6. Mon enfant peut manger un aliment aujourd'hui et le refuser demain (<i>My child can accept one food one day and refuse it the next day</i>)	3.4	1.3	0.24	0.89
P10. Mon enfant peut manger certains aliments en grandes quantités et d'autres pas du tout (<i>My child can eat some foods in large amounts and completely reject others</i>)	4.0	1.1	0.15	0.69
N1. Mon enfant recherche constamment des aliments familiers (<i>My child is constantly looking for familiar foods</i>)	3.2	1.2	0.79	0.05
N2. Mon enfant se méfie des aliments nouveaux (<i>My child is suspicious of new foods</i>)	3.2	1.2	0.78	0.05
N4. Mon enfant aime seulement la cuisine qu'il connaît (<i>My child only likes the familiar foods</i>)	2.6	1.2	0.83	0.07
N6. Mon enfant rejette un nouvel aliment avant même de l'avoir goûté (<i>My child rejects a novel food before even tasting it</i>)	3.0	1.3	0.73	0.10
N7. Mon enfant est angoissé à la vue d'un nouvel aliment (<i>My child gets upset at the sight of a novel food</i>)	2.0	1.1	0.90	0.20

N10. Mon enfant ne goûte pas un nouvel aliment si cet 2.6 1.1 0.62 0.13
aliment est en contact avec un autre aliment qu'il
n'aime pas (*My child won't try a novel food if it is touching*
another food he/she does not like)



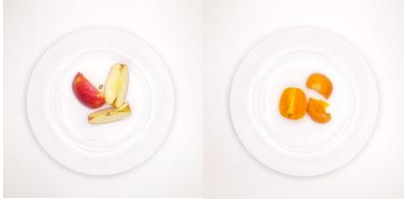





950 *Note.* The criterion for loading was > 0.45. Items referring to neophobic

951 behaviors are coded *N* and items referring to picky behaviors are coded

952 *P.*

953

954 Table 2: Pairs of foods used in the food choice task.

Food categories	Food pairs used for neophobia	Food pairs used for pickiness
Starchy products	ordinary rice-black rice (N) 	pasta with tomato sauce 
Fruit	Apple-persimmon (N) 	fruit salad 
Vegetables	green beans-winged beans (N) 	green peas with carrots 
Dairy products	Cow's milk cheese-tofu (N) 	yoghurt with blackberries 

955 *Note.* The novel foods are marked (N).

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957

958 Table 3: Mean scores and standard deviation (SD) on the 11-item
 959 scale at test and retest (n= 74). Comparisons between mean values
 960 made using paired t-tests and Pearson's rho coefficient.

Item	Test		Re-test		t-test		Pearson's rho	
	Mean	SD	Mean	SD	p value		r	
P3	3,3	1.2	3.3	1.2	0.53	<i>ns</i>	0.55	***
P4	3.3	1.2	3.1	1.2	0.07	<i>ns</i>	0.73	***
P5	3.9	0.7	3.8	0.8	0.32	<i>ns</i>	0.61	***
P6	3.4	1.3	3.4	1.2	0.64	<i>ns</i>	0.67	***
P10	4.0	1.1	3.9	1.1	0.54	<i>ns</i>	0.77	***
Overall P	17.9	5.5	17.5	5.6	0.18	<i>ns</i>	0.83	***
N1	3.2	1.2	3.1	1.2	0.61	<i>ns</i>	0.71	***
N2	3.2	1.2	3.1	1.2	0.45	<i>ns</i>	0.60	***
N4	2.6	1.2	2.6	1.1	0.67	<i>ns</i>	0.77	***
N6	3.0	1.3	2.9	1.2	0.27	<i>ns</i>	0.77	***
N7	2.0	1.1	2.1	1.0	0.60	<i>ns</i>	0.65	***
N10	2.6	1.1	2.5	1.1	0.82	<i>ns</i>	0.58	***
Overall N	16.5	4.0	16.3	4.2	0.59	<i>ns</i>	0.85	***
Overall	34.4	8.6	33.9	9.0	0.24	<i>ns</i>	0.90	***

961 *Note.* Ns = no significant difference. *** $p < 0.001$.

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963

964 **Appendix. 35-item version of the CFRS**965 *Pickiness subscale*

966 **P1=mon enfant accepte une variété limitée d'aliments** (my child
967 accepts only a small variety of foods, *adapted from the CEDQ; Rigal et*
968 *al., 2012*)

969 **P2=mon enfant mange en petites quantités** (my child eats in small
970 quantities, *novel item*)

971 **P3=mon enfant refuse de manger certains aliments à cause de leurs**
972 **textures** (my child refuses certain foods due to their texture, *novel item*)

973 **P4=mon enfant fait le tri dans son assiette** (my child sorts his/her food
974 on the plate, *novel item*)

975 **P=mon enfant rejette certains aliments après les avoir goûté** (my
976 child rejects certain foods after tasting them, *novel item*)

977 **P6=mon enfant peut manger un aliment aujourd'hui et le refuser**
978 **demain** (my child can accept a food one day and refuse it the next day,
979 *novel item*)

980 **P7=il est difficile de faire plaisir à mon enfant avec un plat que j'ai**
981 **cuisiné** (my child is difficult to please with homemade meals, *adapted*
982 *from the CEBQ; Wardle et al., 2001*)

983 **P8=mon enfant préfère lorsque les aliments sont en petites**
984 **quantités dans son assiette** (my child prefers having small quantities
985 on the plate, *novel item*)

986 **P9=une mauvaise expérience alimentaire empêche mon enfant de**
987 **goûter l'aliment à nouveau** (a bad experience would keep my child
988 from trying a food again, *from the FAS; Frank & van der Klaauw, 1994*)

989 **P10=mon enfant peut manger certains aliments en grandes**
990 **quantités et d'autres pas du tout** (my child can eat some foods in large
991 amounts and completely reject others, *novel item*)

992 **P11=mon enfant est sélectif pour la nourriture** (my child is a picky
993 eater, *novel item*)

- 994 P12=**mon enfant est difficile avec la nourriture lorsqu'un aliment**
995 **est en contact avec autre aliment qu'il n'aime pas** (my child is picky
996 when one food touches another food that he/she does not like, *novel*
997 *item*)
- 998 P13=**à la cantine scolaire, mon enfant ne mange qu'une partie des**
999 **aliments proposés** (in the school canteen my child eats only a small
1000 variety of foods, *novel item*)
- 1001 P14=**quand on mange chez des amis, mon enfant fait le tri dans son**
1002 **assiette** (when we eat with friends my child sorts his/her food on the
1003 plate, *novel item*)
- 1004 P15=**mon enfant est difficile pour la nourriture même en présence**
1005 **de camarades faciles pour la nourriture** (my child is picky even when
1006 he/she is with friends who are not picky eaters, *novel item*)
- 1007 P16=**mon enfant est difficile pour la nourriture quand il est invité à**
1008 **des fêtes** (my child is picky when he/she is invited to parties, *novel item*)
- 1009 P17=**mon enfant est difficile pour la nourriture même si on lui dit**
1010 **que ce qu'il y a dans son assiette a bon goût** (my child is picky even if
1011 we tell him/her that the food on the plate is tasty, *novel item*)
- 1012 P18=**mon enfant est difficile pour la nourriture même si on ajoute un**
1013 **aliment qu'il aime dans son assiette** (my child is picky even if we add a
1014 food he/she likes on the plate, *novel item*)
- 1015
- 1016 *Neophobia subscale*
- 1017 N1=**mon enfant recherche constamment des aliments familiers** (my
1018 child is constantly looking for familiar foods, *adapted from the FNS; Pliner*
1019 *& Hobden 1992*)
- 1020 N2=**mon enfant se méfie des aliments nouveaux** (my child is
1021 suspicious of new foods, *adapted from the FNS; Pliner & Hobden 1992*)

- 1022 N 3=**si mon enfant ne sait pas ce qu'il y a dans un plat, il n'y**
 1023 **goûte pas** (if my child does know what is in a food, he/she won't try it,
 1024 *from the FNS; Pliner & Hobden 1992)*
- 1025 N4=**mon enfant aime seulement la cuisine qu'il connait** (my child only
 1026 likes the food he/she knows, *adapted from the FNS; Pliner & Hobden*
 1027 *1992)*
- 1028 N5=**mon enfant ne goûte pas un nouveau plat si un de ses**
 1029 **ingrédients lui déplaît** (my child won't taste a dish if he/she dislikes one
 1030 of its components, *adapted from Ton Lu, 1996)*
- 1031 N6=**mon enfant rejette un nouvel aliment avant même de l'avoir**
 1032 **goûté** (my child rejects a novel food before even tasting it, *novel item*)
- 1033 N7=**mon enfant est angoissé à la vue d'un nouvel aliment** (my child
 1034 gets upset at the sight of a novel food, *novel item*)
- 1035 N8=**mon enfant aime identifier chacun des aliments présents dans**
 1036 **son assiette** (my child likes to identify each of the foods on the plate,
 1037 *novel item*)
- 1038 N9=**mon enfant a peur de goûter des aliments nouveaux** (my child is
 1039 afraid to taste novel foods, *adapted from the QENA; Rubio et al., 2008)*
- 1040 N10=**mon enfant ne goûte pas un nouvel aliment si cet aliment est**
 1041 **en contact avec un autre aliment qu'il n'aime pas** (my child won't try a
 1042 novel food if it is touching another food he/she does not like, *novel item*)
- 1043 N11=**a la cantine scolaire, mon enfant refuse de manger des**
 1044 **aliments nouveaux** (at school canteen, my child refuses to eat novel
 1045 foods, *novel item*)
- 1046 N12=**mon enfant montre des signes d'anxiété lorsque l'on va**
 1047 **manger chez des amis** (my child gets anxious when we eat with friends,
 1048 *adapted from the FNS; Pliner & Hobden 1992)*
- 1049 N13=**quand on mange chez des amis, mon enfant choisit des plats**
 1050 **qu'il connait** (when we eat with friends, my child picks foods he/she
 1051 knows, *adapted from the FNS; Pliner & Hobden 1992)*

- 1052 N14=**mon enfant évite les aliments nouveaux même en présence**
1053 **de camarades goûtant à ces aliments** (my child avoids novel foods
1054 even when he/she is with friends trying these new foods, *adapted from*
1055 *the QENA; Rubio et al., 2008*)
- 1056 N15=**mon enfant évite les aliments nouveaux quand il est invité à**
1057 **des fêtes** (my child avoids novel foods when he/she is invited to parties,
1058 *adapted from the QENA; Rubio et al., 2008*)
- 1059 N16=**mon enfant ne goûte pas un nouvel aliment même si on lui dit**
1060 **qu'il a bon goût** (my child won't try a novel food even if we tell him/her it
1061 is tasty, *adapted from the QENA; Rubio et al., 2008*)
- 1062 N17=**mon enfant ne goûte pas un nouvel aliment même si on ajoute un**
1063 **aliment qu'il aime dans son assiette** (my child won't try a novel food even if
1064 we add a he/she likes on the plate, *adapted from the QENA; Rubio et al., 2008*).