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The Development of a Single-Item Food Choice Questionnaire

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Abstract

Based on the multi-item Food Choice Questionnaire (FCQ) originally developed by Steptoe and colleagues (1995), the current study aimed to develop a single-item FCQ that provides an acceptable balance between practical needs and psychometric concerns. Studies 1 (*N*=1,851) and 2 (2a (*N*=3,290), 2b (*N*=4,723), 2c (*N*=270)) showed that the single-item FCQ scale has *good convergent and discriminant validity*. Generally, the results showed the highest correlations with the related multi-item dimensions (>.40). Study 2 refined the scale. Only the items for convenience (Study 2a), sensory appeal (Study 2b) and mood (Study 2c) needed to be revised (as Study 1 showed a correlation between the multi-item and the single-item below the threshold of .60). The results also showed comparable *predictive validity*. Both methods revealed similar association patterns between food motives and consumption behaviours (Fisher's z tests revealed agreements of 86.2% for Study 1, 92.9% for Study 2a and 100% for Studies 2b and 2c). Study 3 (*N*=6,062) showed an example of the added value of a *context-specific application* for the single-item FCQ. Different motives were shown to be relevant across contexts, and the context-specific motives had additional explained variance beyond the general multi-item FCQ. Studies 2b and 3 also showed the performance of the single-item FCQ in an *international context*. In sum, the results indicate that the single-item FCQ can be used as a flexible and short substitute for the multi-item FCQ. The study also discusses the conditions that should be considered when using the single-item scale.

Keywords: food choice motives, scale development, single item measure, reliability, validity, benefits, construct, motivation

1. Introduction

A large body of research has focused on understanding consumer food choices, including *why* consumers choose and consume specific food products. Traditionally, socio-demographic variables (e.g., Aertsens et al., 2009), attitudes and social norms have been used to gain insights into consumer food choices (e.g., theory of planned behaviour, Ajzen, 1991; Vermeir & Verbeke, 2008). Beyond the abovementioned traditional variables, the inclusion of food choice motives (i.e., Food Choice Questionnaire; Steptoe et al., 1995) is of added value in explaining food choices (Dowd & Burke, 2013). *Food choice motives* refer to consumers' motives, reasons or motivations for choosing or eating food. Insights into these motives are valuable for developing interventions, policies, innovations and campaigns related to food consumption (e.g., Glanz et al., 1998).

The Food Choice Questionnaire (FCQ) can be regarded as the standard method for measuring the motivations underlying food choice. The FCQ was originally developed by Steptoe and colleagues (1995). It is used to assess nine distinct food choice motives: health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concerns. Later studies have modified the FCQ to further develop its ethical dimension (e.g., Lindeman & Vaänanen, 2000; Sautron et al., 2015). Lindeman and Vaänanen (2000) extended the FCQ by adding animal welfare, environmental protection, and political and religious values.

The original FCQ and the modified versions have been used extensively. For example, they have been used to explore consumer food choices in specific countries (e.g., Glanz et al., 1998; Honkanen & Frewer, 2009; Januszewska et al., 2011; Milošević et al., 2012; Pieniak et al., 2009; Prescott et al., 2002) or for specific products, e.g., those that are healthy (Sun, 2008) or environmentally friendly (Lockie et al., 2002). Additionally, the scale can be used to reveal patterns in importance ratings across subgroups of consumers, based on characteristics such as

sex, income and age (e.g., Locher et al., 2009; Piggford et al., 2008; Steptoe et al., 1995), vegetarianism (Lindeman & Vaänanen, 2000) or sustainable food behaviour (Verain et al., 2016a). Finally, food choice motives can be a valuable basis for consumer segmentation (i.e., post hoc identification of homogenous groups) because the motives relate to food choices and content-related food communication (e.g., Bellows, Alcaraz & Hallman, 2010; Kornelis et al., 2010; Onwezen & Bartels, 2011; Onwezen, 2017; Verain et al., 2017).

1.1 The need for a shorter FCQ

The traditional multi-item questionnaire contains 36 items (Steptoe et al., 1995). These items are usually computed as single scores for each dimension by calculating the mean of the unweighted items (e.g., Pieniak et al., 2009; Verain et al., 2016b). There are several arguments that point to the need for a shorter version of the FCQ.

First, long questionnaires are generally believed to **decrease the quality of the respondents' answers** (e.g., Lezner et al., 2010). More specifically, multi-item scales can lead to fatigue, high error variance (Johnson et al., 1990), irritation and reliance on response styles instead of the careful consideration of the items (Böckenholt & Lehmann, 2015; Dillman, 2000; Matzat et al., 2009; Rolstad et al., 2011). Because of **societal trends**, such as the use of mobile phones and shorter attention spans in an era of information overload, the need for shorter app-based surveys becomes increasingly relevant (Alam et al., 2014).

Second, long questionnaires have several disadvantages for researchers. The original FCQ is a relatively long measurement scale and may be perceived as such. This can lead to high drop-out rates. Studies using the FCQ have reported drop-out rates of 16% (Renner et al., 2012). High drop-out rates are associated with unbalanced samples (Mallinckrodt et al., 2001). This might pose problems for researchers who generally strive for **representative balanced samples**. Furthermore, long measurement scales impede **research opportunities** as they leave

less space in the survey (because of time and money constraints) for the inclusion of other relevant constructs.

Third, the original FCQ was developed to measure consumer motives regarding *general food choices*, whereas the literature generally states that *specific measures* show a **higher explained variance regarding behaviours on the same level of specificity** ('just as soccer performance is better predicted by soccer ability than by general athletic ability'; Goldsmith et al., 1995; Moskowitz, 1982). We proposed that, in some studies, a context-specific FCQ measure (e.g., measures that include meal moment, product group or social interaction) can have a higher explained variance than a general FCQ measure. A shorter FCQ would be more suitable for measuring food motives in *multiple* contexts and for including *multiple* products within one study.

Specifically, in the context of food choice motives, researchers have argued for a shorter measurement scale (Fotopoulos et al., 2009; Konttinen et al., 2013). For example, Fotopoulos et al. (2009) **do not support the robustness of the FCQ** (with and without the ethical dimensions of Lindeman and Vaänanen (2000)). They provided support for the statement that the measurement might be improved and made more robust by **including fewer (e.g., bundling health and natural) and more abstract items**. Following their reasoning, a single-item measure might be more robust for representing the underlying dimensions.

Thus, there is a range of arguments that point to the need for a shorter single-item FCQ. Generally, multi-item measures are assumed to be more reliable than single-item measures. However, when the dimensions are unidimensional and can thus be easily and uniformly measured by a single item, single-item measures might have comparable performance (Rossiter, 2002). Bergkvist and Rossiter (2007), for example, showed that single-item measures can have as high predictive validity as multi-item measures for brand attitude and attitude towards an advertisement. Because the FCQ is designed to represent uniform food dimensions, a single-

item measure might have comparable performance. We therefore aimed to develop and to test the performance of a single-item FCQ. It must be noted that we do not argue that the single-item scale performs better than the multi-item measure. Instead, we aimed to determine whether, and under what conditions, a single-item scale provides an acceptable balance between practical needs and psychometric concerns.

A review of the literature revealed that a single-item version of the FCQ has not yet been developed. We did find studies that had applied single-item scales for food choice motives (e.g., Onwezen & Bartels, 2011; Onwezen et al., 2012; Verain et al., 2017). These studies used single-item measures of the FCQ as a means to an end. For example, they used the single-item measures as a segmentation variable to identify groups of individuals based on their motives for making food choices. However, these studies did not compare the performance of a single-item FCQ with that of a multi-item FCQ. It therefore remains unclear whether a single-item FCQ can be used as a substitute for the multi-item FCQ.

1.2 Current study

The current study was designed to develop and to test the performance of a single-item FCQ and to determine the applicability of a single-item scale across multiple contexts.

Five studies were conducted[1]. Studies 1 (N=1,851), 2a (N=3,290), 2b (N=4,723) and 2c (N=270) compared the performance of the single-item FCQ and the multi-item FCQ by assessing discriminant validity, convergent validity and predictive validity. In Study 1, both scales were included in a single questionnaire and were therefore measured at the same time. In Study 2a, the multi-item FCQ and single-item FCQ were measured at different times to avoid common method biases (Podsakoff et al., 2003). Additionally, the measurement scale needed refinement regarding the convenience (Study 2a), sensory appeal (Study 2b) and mood (Study

[1] All studies were part of larger studies. This had some consequences for the study designs. For example, in Study 2a, randomizing the single- versus multi-item measure would have been more suitable for the current research question, but this was not feasible for the overall project.

2c) dimensions. Study 3 (N=6,062) provided an example of the use of the single-item scale to assess the differences in food motives across contexts, and it investigated whether this increased the predictive validity beyond that of the general multi-item FCQ. Additionally, Study 2b and Study 3 demonstrated the performance of the single-item FCQ in an international context.

2. Study 1

2.1 Method

2.1.1 Participants. A research agency selected a sample of Dutch participants who were representative of the population in terms of age and gender. The sample consisted of 1,851 respondents, of whom 46.2% were male, with a mean age of 45.3 years (SD=15.8).[2]

2.1.2 Measures: multi-item FCQ. The updated version of the FCQ was used because this version has been shown to be more robust than the original FCQ (Fotopoulos et al., 2009; Konttinen et al., 2013; Verain et al., 2016a). Following the example of Lindeman and Vaänanen (2000), we included items measuring the environment, animal welfare and social justice (e.g., 'is produced in an animal friendly way'). The participants were asked to respond to the statement 'It is important to me that the food I eat on a typical day' for 33 items on a seven-point scale (ranging from 1 *'not at all important'* to 7 *'very important'*; see Appendix II).

2.1.3 Single-item FCQ. A single-item measure for each of the factors of the FCQ was developed (8 dimensions from Steptoe et al. (1995), and 3 ethical dimensions following Lindeman and Vaänanen (2002)). Because the sensory dimension comprises multiple aspects for consumers (Lusk & Briggeman, 2009), we used two items – one on taste and one on appearance. All other motives were measured with one item (resulting in a total of 12 single items). The participants were asked to respond to the statement 'For food choices the following motives are important to me …': (e.g., healthy, makes me feel good). See Appendix I for the items.

[2] Distribution of the total Dutch population in 2017 was 49.6% male, with a mean age of 41.6 years.

2.1.4 Self-reported consumption. Self-reported consumption was measured following the example of Onwezen et al. (2014a; 2014b) by asking the participants to indicate how often they had eaten meat, vegetables and fruit during the previous month on a seven-point scale (ranging from 1=*'not this month'* to 7=*'6-7 days a week'*).

2.2 Analysis

The performance of the single-item scale was compared to that of the multi-item scale for convergent and discriminant validity and predictive validity.

2.2.1. Convergent and discriminant validity. It was expected that the single-item FCQ would show a higher correlation with the multi-item scale for the same motive (convergent validity) as compared to the other motives (discriminant validity; Chassany, Sagnier, Marquis, Fullerton & Aaronson, 2002; Robins et al., 2001; Van Hooff et al., 2007). For convergent validity, the correlation between each item and its own dimension should be at least .40 (Hays & Hayashi, 1990). For discriminant validity, items should have a correlation below .60 (Cronbach, 1961). Note that previous studies have already shown that some dimensions of the FCQ have high correlations (e.g., natural with health) (e.g., Steptoe et al., 1995; Pieniak et al., 2009). We aimed to develop a measurement scale comparable to the multi-item scale. We therefore used the discriminant validity-threshold of .60 but monitored the correlations between the components of the multi-item scale itself.

2.2.2. Predictive validity. Predictive validity refers to the usefulness for predicting relevant outcome measures. We used Bergkvist and Rossiter's (2007) method to compare the predictive validity of the single-item scale with that of the multi-item scale.

Linear regression analyses were conducted with each single- and multi-item measure as an independent variable and the consumption of different product categories as dependent variables. This resulted in a large range of regression analyses ((12 single items + 11 multi-item dimensions) × 3 product categories=69). Separate regression analyses were conducted such that

the coefficients did not influence one another and the pure effects of each dimension could be compared across the multiple-item and single-item scales.

The relative performance of the single- and multi-item measures was compared by dividing the regression coefficients between the most and least important predictors. The relative performance was included to ensure that both methods (the multi- and single-item measures) resulted in similar conclusions regarding the relevance of the predictors. The comparability of the regression coefficients was further explored via Fisher's z-tests. The Fisher's z-test can be used to assess significant differences across correlation coefficients. We followed the threshold of Lee et al. (1989), which meant that an agreement of 0.75 or higher indicated that one method could replace the other.

2.3 Results

2.3.1. Discriminant and convergent validity. The results (Table 1) showed, as expected, that all single items had the highest correlation with the related multi-item dimensions and were higher than .40. This indicates that the single-item scale indeed had similar underlying dimensions and no other dimensions (good discriminant and convergent validity, respectively). Regarding convergent validity, there was a higher correlation between the multi-item sensory measure for good feeling than that for taste. Regarding discriminant validity, naturalness and health were correlated above the threshold (>.60), and there were correlations between naturalness, environmentally friendliness and animal friendliness above the threshold. This indicates that these dimensions might have been difficult for consumers to differentiate. We argue that this overlap between dimensions is not the result of the single-item measurement because we saw similar variations in the strength of the correlation coefficients between the original multi-item dimensions ($R^{natural\&health}$=.62, $R^{natural\&env}$=.65, $R^{natural\&animal}$=.60, $R^{env\&animal}$=.77, $R^{env\&social}$=.70, and $R^{social\&animal}$=.83).

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2.3.2. Predictive validity. Table 2 shows the motives associated with consumption. Generally, the results showed the same pattern for the predictive values across the single- and multi-item scales, with an agreement of 91.7%. For example, for fruit consumption, both measurement methods showed that the motives of health, naturalness, weight control, environmental friendliness, animal friendliness and social justice had the highest predictive value and that sensory appeal, familiarity, price, convenience and mood had the lowest predictive value. Fisher's z tests revealed that only 5 of all predictive values differed significantly; this refers to an agreement of 86.2%.

The results for ease of preparation and taste were different for the measurement methods in two of the three cases. This indicates that these dimensions showed lower comparability in predictive validity, and this might have been related to the lower levels of convergent validity for these motives.

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2.4 Conclusion

The single-item scale showed promising results regarding convergent and discriminant validity. The motives showed the expected correlations with the multi-item scale. Additionally, the results illustrated the potential of the single-item FCQ for predicting self-reported food intake behaviour (i.e., similar patterns in associations with consumption behaviours). In sum, the results indicated that single-item scales can be used as a shorter substitute for the multi-item FCQ when the results for the convenience, sensory appeal and mood dimensions are interpreted with caution. Study 2 therefore aimed to refine the single-item FCQ measurement of convenience (Study 2a), sensory appeal (Study 2b) and mood (Study 2c).

3. Study 2a: refining the measure of convenience

Study 2a aimed to refine the convenience measure of so that the entire convenience dimension would be covered by one item. Furthermore, Study 2a aimed to replicate the findings

of Study 1 by measuring the multi-item and single-item FCQs at different times. This was done to avoid common method biases, which could account for the similarity across the single- and the multi-item measure in Study 1, because respondents tend to provide similar answers when they are asked to answer comparable items in a single survey (Podsakoff et al., 2003). Study 2a aimed to account for common method variance.

Additionally, we included a broader range of consumption measures to further explore the predictive validity. We added pork, beef, chicken, fish and dairy consumption.

3.1 Method

3.1.1. Participants. A research agency selected Dutch participants who were representative of the population in age and gender. The sample was 43.2% male, with a mean age of 49.8 years (*SD*=13.9).[2]

The data were collected in two waves. In the first wave, 3,290 respondents answered questions on the single-item FCQ and self-reported their consumption. In the second wave, two weeks after the first wave, the respondents completed the multi-item FCQ and the same items as in wave 1 regarding self-reported consumption. The second questionnaire was completed by 56.2% of the first-wave participants, resulting in a total of 1,848 respondents.

3.1.2. Measures. Study 2 used the same measures as Study 1, with two exceptions. First, the motive of convenience was refined to measure not only convenience of preparation (as in Study 1) but convenience in general. This seemed more similar to the multi-item dimension of Steptoe et al. (1995). Second, to ensure that the lower correspondence between the multi-item and single-item measures for mood were not the result of the selection of items, the multi-item measure of mood was also measured with ‘helps me cope with life’ (see AppendixII).

3.1.3. Analyses. We used similar analyses as those for Study 1.

3.2 Results

3.2.1. Discriminant and convergent validity. The results showed (Table 3), as expected, that all of the single items had the highest correlation with the related multi-item measures, with the exception of mood. All correlations were above the threshold (>.40), except for mood and taste.

Measuring mood with a different set of mood items did not resolve the issue of a low correlation between the single- and multiple-item measures for mood. Regarding the low correlations for taste and sensory features, this finding indicated that the single-item measured a more specific aspect (i.e., taste and appearance) of sensory appeal than the general category, which also referred to texture and smell. The results generally showed good discriminant and convergent validity, but for the multifaceted constructs (mood and sensory appeal) the results should be interpreted with caution.

It should be noted that although the results were similar to those of Study 1, the correlations were generally lower. This occurred presumably because the two studies were conducted at different times. Thus, common method variance was ruled out, and this might have led to inflated correlations in Study 1(Podsakoff et al., 2003).

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3.2.2. Predictive validity. Table 4 shows similar predictive validity in relation to food intake for the single-item scale compared to the multi-item scale. For example, for fruit and vegetable consumption, both measurement methods revealed the highest predictive value for health and natural features, followed by sustainable motives. Another example shows that animal welfare had the highest predictive value for the single- and multi-item scales for pork, beef and chicken consumption. The overall agreement was 89.3%. This indicated that, generally, both methods could be used to draw similar conclusions. Fisher's z tests also revealed a high agreement of 92.9% between the predictive values of both methods.

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4. Study 2b: refining the measure of sensory appeal

Study 2b aimed to refine the sensory appeal measure to cover the whole dimension with one item. Furthermore, Study 2b aimed to replicate the findings of Studies 1 and 2a in an international context with a broader range of consumption measures (meat replacers and takeaway were included) to further explore the predictive validity.

4.1 Method

4.1.1. Participants. A research agency selected a sample of Dutch (*n*=1,046), German (*n*=2,146), Belgian (*n*=524) and English (*n*=1,007) participants who were representative of the population in terms of age and gender[3]. The sample consisted of 4,723 respondents (the Netherlands (42.3% male; *M*=47.2), Germany (37.6% male; *M*=40.0), the United Kingdom (38.5% male; *M*=44.1) and Belgium (40.8% male; *M*=40.8)).

4.1.2. Measures. The version of the *multi-item FCQ* from Study 1 was used (see Appendix II). The *single-item FCQ* from Study 2a was used, except for the sensory appeal item, which was modified to address all aspects of the sensory dimensions of Steptoe et al. (1995) in one item: 'provides me with pleasurable sensations (e.g., texture, appearance, smell and taste)'. Finally, following the example of Study 1, *self-reported consumption* was measured regarding fruit, vegetables, meat, meat replacement and takeaway (the last two were included to cover a broader range of categories).

4.1.3. Analyses. We used similar analyses as those used in Studies 1 and 2a.

[3] Percentage of males and mean age per country in 2016 were as follows: the Netherlands (49.6%; *M*=41.6), Germany (48.5%; *M*=47.7), the United Kingdom (49.5%; *M*=41.7) and Belgium (45.5%; *M*=41.4).

4.2. Results

4.2.1. Discriminant and convergent validity. The results (Table 5) showed, as expected, that all single items had the highest correlation with the related multi-item dimensions – higher than .40, showing good discriminant and convergent validity.

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4.2.2. Predictive validity. Table 6 generally showed the same pattern of predictive values (i.e., comparison of relative performance) regarding fruit, vegetables, meat, meat replacement and takeaway across single- and multi-item scales. Overall, the agreement was 94.5%. Similarly, Fisher's z tests revealed an agreement of 100%. This was a very good result, especially because a difference of .03 had already resulted in significant differences for this specific sample size.

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5. Study 2c: refining the measure of mood

Study 2c aimed to refine the measure of mood appeal to cover the whole dimension of mood in one item.

5.1 Method

5.1.1. Participants. A small pilot study among 270 respondents (51.5% male, mean age 36 years (*SD*=11.0)) was performed via MTurk.

5.1.2. Measures. The original multi-item FCQ (Steptoe et al., 1995) and the same single-item FCQ measures from Study 2a were included. We modified the single item of mood so that it would be more general ('...is a way of monitoring my mood (e.g., a good feeling or coping with stress')). Self-reported consumption was measured as in the example from Study 1 by asking the respondents to indicate how often they had eaten fruit and vegetables during the previous month on a ten-point scale (ranging from 1='*not this month'* to 10='*each day'*).

5.2. Results

5.2.1. Discriminant and convergent validity. The analyses performed were similar to those for the previous studies. The results showed (Table 7) that all of the single items had the highest correlation with the related multi-item dimensions and – higher than .40, with the exception of social justice, which correlated higher with environment.

5.2.2 Predictive validity. Overall, the results showed comparable predictive validity between the single- and multi-item scales, resulting in 91.6% agreement (Table 8). In addition, Fisher's z tests revealed an agreement of 100%.

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5.3. Conclusion

The results of Study 2 showed that the single-item scale had good convergent and discriminant validity (Studies 2a, 2b and 2c) in an international context (Study 2b). Additionally, the results showed similar patterns in predictive validity across the single- and multi-item measures. The modified single-item FCQ solved the issues regarding convenience, sensory appeal and mood. All dimensions were best measured with a general comprehensive item.

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6. Study 3

The aim of Study 3 was to provide an example of the added value of a single-item measurement in specific contexts (thus, not to compare the performance of both measures, as in Studies 1 and 2).[4]

[4] Note that Study 4 was actually performed before Study 3 (e.g., visible in the use of the 'old' single-item measures). We decided to report the studies in a different order because this was a more logical order.

6.1. Method

6.1.1. Participants. A research agency approached respondents from 9 European countries: the Netherlands (*n*=701), Germany (*n*=712), the United Kingdom (*n*=695), Poland (*n*=626), Spain (*n*=651), Greece (*n*=637), France (*n*=649), Croatia (*n*=680) and Serbia (*n*=710), resulting in a total of 6,062 respondents. The research agency was asked to select nationally representative samples in terms of gender and age: for the Netherlands (51.1% male; *M*=44.8), Germany (50.3% male; *M*=44.8), the United Kingdom (49.6% male; *M*=44.1), Poland (51.7% male; *M*=42.9), Spain (51.5% male; *M*=44.0), Greece (50.2% male; *M*=42.5), France (49.6% male; *M*=44.7), Croatia (50.2% male; *M*=43.4) and Serbia (50.3% male; *M*=43.8) [5].

6.1.2. Measures: multi-item FCQ. The Steptoe et al. (1995) scale and the environmental dimension following the example of Verain et al. (2016a) were used. Social justice and animal welfare were excluded because these motives were not relevant within the context of the included dependent variables (salty snacks and vegetables, as described below).

Single-item FCQ. The single-item FCQ was assessed as in Study 2a. As was done with the multi-item scale, social justice and animal welfare were excluded. Additionally, sensory appeal was measured with taste only and no longer also with appearance.

Similar to Onwezen and colleagues (2012), we selected six contexts that showed a relationship with various motives for food choice. The respondents rated the importance of motives for main meals and snacks in three different consumption situations: at home, at work/school and on the move, e.g., ‘When having a snack at home’ and ‘When having a snack on the go’.

Self-reported consumption. Food frequency questionnaires (Hu, Rimm & Smith-Warner, 1999) were used to measure vegetable consumption and salty snack consumption. We

[5] The percentage of males and mean age for overall population per country in 2016 were as follows: the Netherlands (49.6%; *M*=41.6), Germany (48.5%; *M*=47.7), the United Kingdom (49.5%; *M*=41.7), Poland (47.0%; *M*=40.7), Spain (49.0%; *M*=42.7), Greece (47.5%; *M*=44.5), France (48.0%; *M*=41.4), Croatia (46.5%; *M*=43.0) and Serbia (47.5%; *M*=42.6).

selected two product categories that are often used as snacks despite also having different associations, such as (un)healthiness. The respondents were asked to indicate the frequency with which they had consumed the specific foods during the previous week (1='*not at all*' to 7='*every day*'). If the respondents had consumed a product, they were asked to estimate the amount they had consumed each day. The results were combined into one score (frequency × amount) for the different categories.

6.1.3. Analyses. First, ANOVAs were calculated with motives as dependent variables and context as the independent variable. Tukey post-hoc analyses revealed which motives were significantly different depending on the context. Next, hierarchical regression analyses with two blocks revealed the added value of context-specific FCQs. The multi-item FCQ was included in the first block, and the context-specific single-item motives were included in the second block. This resulted in six different regression analyses.

6.2. Results

6.2.1. Importance ratings. Table 10 shows the mean scores for the multi-item FCQ for general food choices and the single-item FCQ for the six specific contexts. Generally, and in line with previous studies, taste (sensory appeal) was the most relevant motive, followed by health. Weight control and familiarity were generally the least important.

The results also showed the first indication for the additional value of measuring food choice motives in different contexts. Convenience was, for example, more important in out-of-home contexts (work/school and on the move) than it was at home, whereas taste was more important at home than in out–of-home contexts. Furthermore, weight, healthiness and naturalness were less important for snack consumption than for main meal consumption.

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6.2.2. Predictive validity of vegetable and salty snack intake.

Hierarchical regression analyses with two blocks revealed the added value of context-specific motives. The multi-item FCQ was included ($R^{2vegetable}$=.017–.022; $R^{2salty\ snack}$=.009–.011) in the first block, and the context-specific single-item motives were included in the second block. For vegetable consumption, the context-specific measures explained additional variance for dinner on the move ($R^{2change}$=.10; p<.05) and dinner at home ($R^{2change}$=.08; p<.05). For salty snack consumption, the context-specific single-item FCQ showed an additional explained variance in all contexts ($R^{2change}$=.006–.010; p<.05).

6.3. Conclusion

Study 3 showed the additional value of a short (single-item) scale that enables the measurement of food choice motives within different contexts because: 1) the importance ratings vary across contexts and 2) context-specific motives have been shown to increase the explained variance beyond the general FCQ. It must be noted that the increases in explained variance resulting from a context-specific FCQ were significant for all salty snack consumption contexts and for only for eating dinner (on the move and at home) for vegetable consumption. One possible explanation is that respondents were more inclined to think of vegetables rather than salty snacks when answering questions about food (i.e., general multi-item FCQ).

Based on the results, we could not ascertain whether the increase in explained variance for the context-specific FCQ beyond the multi-item FCQ was explained by the difference in the measurement (single versus multi-item) or the difference in the level of specificity (general food versus specific context). Nevertheless, the fact that the results of Studies 1 and 2 showed similar performance for both measurement methods implies that the increases in explained variance resulted from a context-specific measure in the FCQ (level of specificity).

7. General discussion

The FCQ is often used to measure consumers' food choice motives and has been shown to be relevant in many countries and contexts. However, the original FCQ has some drawbacks that, at least to some extent, might be solved by developing a single-item FCQ. The results of the current study show that the single-item scale is a good alternative for the multi-item scale. We describe below the conditions under which the single-item scale can and cannot be used.

7.1. Uniformity. The single-item scale shows good convergent validity with the multi-item scale, showing correlations higher than .40 between the related dimensions (Studies 1, 2a, 2b, and 2c). However, as with previous studies, capturing the uniform dimensions seems easier than capturing the multifaceted dimensions (Rossiter, 2002). The current study shows, when we compare the findings of Study 1 and Study 2, that general items that incorporate all aspects into a single item perform better.

7.2 Understanding consumer choices (predictive value). We do not claim that the single-item scale performs better than the multi-item scale; rather, in some cases, both scales provide similar results. Food choice motives are often studied in relation to food intake (Onwezen et al., 2012; Onwezen & Bartels, 2011; Verain et al., 2012). The results show that the single-item scale can be used for questions that help researchers to *understand self-reported consumption.* Both measures showed a similar pattern for the motives underlying food intake (i.e., similar most and least important motives) in Studies 1 and 2 (2a, 2b, and 2c). Thus, for understanding food consumption, the single-item FCQ appears to be a good alternative to the multi-item scale. We included a range of dependent variables (e.g., vegetables, fruit, pork, beef, meat replacers, dairy consumption, and takeaway), and it seems safe to assume that the results would apply to a broad range of consumer food choices.

7.3 Domain-specific research questions. The use of context-specific measures applies to many research areas because it is generally recommended that researchers use context-

specific measures (Judge & Kammeyer-Mueller, 2012). Study 3 exemplifies the usefulness of context-specific measures by showing different predictors across situations and an additional explained variance beyond general food choice motives. For example, future research can use the single-item scale to explore differences across specific consumption times (e.g., snack versus dinner; King et al., 2004; Rozin & Tuorila, 1993), consumption situations (e.g., at home versus outside the home; Bell & Marshall, 2003; Meiselman, Johnson, Reeve, & Crouch, 2000; Onwezen et al., 2011), product categories (e.g., Verain et al., 2016a; 2016b) and social contexts (e.g., alone versus with family).

7.4 Flexibility and striving towards an integrated framework. The single-item FCQ increases the possibility of including multiple motives and assessing their relative importance on the traditional food choice dimensions (e.g., health and naturalness). The FCQ might, for instance, be supplemented by food selection constructs that are apparently missing from the current FCQ conceptual framework (Fotopoulos et al., 2009). For example: (a) general food safety perceptions (Grunert, 2005); (b) personality traits similar to the FCQ's 'familiarity', such as 'food neophobia', 'innovativeness' and 'involvement' (Bartels & Onwezen, 2014; Goldsmith et al., 1995; Onwezen & Bartels, 2013); (c) emotions, given that mood refers to a general trait level, whereas emotions (and their influence) might differ from time to time (DeSmet & Schifferstein, 2008; Onwezen, 2015; Onwezen & Van der Weele, 2016); (d) quality and brands (Chaudhuri & Holbrook, 2001); and (e) perceived quality, freshness, variety and satiety (Machín et al., 2014). It is important to note that these inclusions should be based on theory and not be the outcome of an ad hoc data-driven statistical process (Fotopoulos et al., 2009). Large-scale, rigorous cross-national statistical testing and validation are necessary for the inclusion of additional motives. Such steps might result in an integrated framework for explaining food choices.

7.5 Recommendations for future research

The current study provides an initial exploration of the usefulness of a single-item FCQ. This study focused on the associations between motives and food intake. Future research could explore whether the single-item FCQ is suitable for other types of studies, such as segmentation and ranking studies. The inclusion of other (single-)items, such as the religious dimension mentioned by Lindeman and Väänänen (2000), is also an interesting topic for further study.

Finally, future studies might explore other ways of improving the measurement of consumer food choice motives. For example, because respondents appear to score positively on Likert-scale items, alternatives such as ranking tasks, choice experiments and implicit association tests could be explored.

7.6 Conclusion. In conclusion, the single-item FCQ seems to be a promising alternative to the multi-item scale. Specifically, the single-item FCQ has proved to be a shorter reliable alternative for answering research questions involving the predictive value of food intake. Last, the single-item FCQ shows additional advantages over the multi-item FCQ because it facilitates comparisons of specific situations and eating moments.

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Table 1. Correlation coefficients single- and multi-item FCQ's Study 1

	M **Single-item**	**FCQ_ health**	**FCQ_ mood**	**FCQ_ convenience**	**FCQ_ sensory**	**FCQ_ natural**	**FCQ_ price**	**FCQ_ weight**	**FCQ_ familiar**	**FCQ_ environment**	**FCQ_ animal**	**FCQ_ social justice**
		M 5.24	***M*** 4.35	***M*** 4.75	***M*** 5.21	***M*** 4.75	***M*** 4.66	***M*** 4.65	***M*** 4.00	***M*** 4.44	***M*** 4.79	***M*** 5.07
S_health	5.48	.712**	.398**	.088**	.353**	.615**	.184**	.496**	.058*	.487**	.525**	.560**
S_mood	4.97	.354**	.599**	.236**	.526**	.327**	.220**	.338**	.337**	.367**	.352**	.363**
S_convenience	4.95	.219**	.364**	.593**	.362**	.224**	.318**	.278**	.362**	.252**	.251**	.239**
S_taste	5.72	.403**	.246**	.131**	.512**	.310**	.171**	.252**	.057*	.253**	.340**	.410**
S_appearance	4.83	.308**	.443**	.232**	.573**	.313**	.179**	.320**	.389**	.337**	.305**	.303**
S_natural	5.15	.618**	.429**	.087**	.342**	.699**	.146**	.430**	.123**	.598**	.624**	.618**
S_price	5.13	.203**	.258**	.354**	.335**	.180**	.640**	.235**	.257**	.156**	.158**	.200**
S_weight	4.68	.453**	.462**	.219**	.264**	.417**	.188**	.720**	.227**	.400**	.383**	.385**
S_familiar	4.36	.159**	.382**	.379**	.310**	.194**	.198**	.250**	.686**	.216**	.165**	.142**
S_environment	4.81	.509**	.470**	.132**	.330**	.585**	.175**	.394**	.173**	.763**	.740**	.717**
S_animal	4.99	.494**	.371**	.091**	.301**	.533**	.107**	.353**	.098**	.615**	.804**	.712**
S_social justice	4.76	.489**	.427**	.117**	.305**	.547**	.130**	.356**	.158**	.652**	.677**	.722**

*Note. The grey areas show proposed higher coefficients (convergent validity); FCQ refers to the multi-item scale for the Food Choice Questionnaire (Steptoe et al., 1995); S_ refers to the single-item scale for food choice motives; * = p < .05; ** = p < .001.*

Table 2. Separate regression analyses (R and R^2) for each multiple and single-item motive with different product categories (Study 1).

		Vegetable		Fruit		Meat	
Multi-item measure	**Single-item**	**Multi-item measure**	**Single-item**	**Multi-item measure**	**Single-item**	**Multi-item measure**	**Single-item**
Health	Health	.42	.42	.39	.34	.10	.10
Natural	Natural	.36	.37	.28	.29	.15	.16
Sensory	Appearance	.11	.08	.04 n.s.	.03 n.s.	.03 n.s.	.03 n.s.
	Taste		.23~		.16~		.00 n.s.
Weight	Weight	.22	.17~	.24	.18	.02 n.s.	.01 n.s.
Familiarity	Familiarity	.1	.04 n.s.	.07	.03 n.s.	.09	.06
Price	Price	.03 n.s.	.03 n.s.	.01 n.s.	.00 n.s.	.04 n.s.	.08
Convenience	Convenience	.11	.01 n.s ~.	.06	.03 n.s.	.01 n.s.	.00 n.s. ~
Mood	Mood	.12	.13	.06	.09	.04	.00 n.s.
Environment	Environment	.23	.25	.20	.20	.16	.17
Animal	Animal	.24	.27	.20	.21	.23	.24
Social justice	Social justice	.26	.25	.23	.19	.17	.17

Note. The green areas show the highest predictive values within a product category, and the orange areas show the lowest predictive values.
n.s. indicates that the regression analyses refer to an insignificant predictive model.
~ indicates that Fisher's z tests reveal that the regression coefficients are significantly different $p < .05$.

Table 3. Correlation coefficients single- and multi-item FCQs Study 2a.

	***M* single item**	**FCQ_ health**	**FCQ_ mood**	**FCQ_ convenience**	**FCQ_ Sensory**	**FCQ_ natural**	**FCQ_ price**	**FCQ_ weight**	**FCQ_ familiar**	**FCQ_ environment**	**FCQ_ animal**	**FCQ_ social justice**
M		5.52	4.52	4.64	5.51	4.81	5.29	4.77	3.96	4.69	5.02	5.24
S_health	5.69	.577**	.257**	.040	.247**	.478**	.103**	.415**	.121**	.428**	.376**	.394**
S_mood	5.07	.307**	.255**	.061**	.313**	.261**	.101**	.224**	.121**	.271**	.320**	.255**
S_convenience	4.96	.064**	.228**	.613**	.150**	.040	.270**	.184**	.273**	.094**	.061**	.071**
S_taste	6.16	.244**	.094**	.040	.342**	.162**	.166**	.126**	-.010	.159**	.190**	.187**
S_appearance	4.63	.200**	.201**	.061**	.402**	.179**	.090**	.172**	.169**	.193**	.169**	.171**
S_natural	4.95	.469**	.215**	-.030	.222**	.600**	.049*	.303**	.075**	.574**	.540**	.517**
S_price	5.92	.153**	.163**	.269**	.207**	.093**	.523**	.178**	.138**	.115**	.101**	.098**
S_weight	4.60	.434**	.285**	.081**	.169**	.371**	.075**	.642**	.181**	.346**	.253**	.273**
S_familiar	4.42	.117**	.289**	.285**	.165**	.117**	.144**	.153**	.472**	.116**	.086**	.093**
S_environment	4.36	.440**	.189**	-.030	.142**	.558**	-0.02	.290**	.082**	.655**	.611**	.603**
S_animal	4.59	.393**	.174**	.010	.165**	.510**	.030	.254**	.059*	.604**	.705**	.587**
S_social justice	4.59	.449**	.217**	-.020	.193**	.520**	.040	.304**	.088**	.629**	.588**	.650**

*Note. The grey areas show proposed higher coefficients (convergent validity); FCQ refers to the multi-item scale for food choice motives (Steptoe et al., 1995); S_ refers to the single-item scale for food choice motives; *=p < .05; **=p < .001.*

Table 4. Separate regression analyses (R and R^2) for each multiple- and single-item motive with different product categories (Study 2a).

Multi-item scale	**Vegetable**	**Fruit**	**Pork**	**Beef**	**Chicken**	**Fish**	**Dairy**
	R^2	**R^2**	**R^2**	**R^2**	**R^2**	**R^2**	**R^2**
Health	.30	.31	.11	.01 n.s.	.03 n.s.	.15	.12
Natural	.21	.26	.16	.04 n.s.	.06	.16	.03 n.s.
Sensory	.07	.05	.05	.05	.09	.05	.07
Weight	.14	.19	.10	.01 n.s.	.08	.11	.09
Familiarity	.08	.01 n.s.	.06	.01 n.s.	.04 n.s.	.07	.01 n.s.
Price	.06	.09~	.07	.04 n.s.	.05	.12	.00 n.s.
Convenience	.15	.09	.03 n.s.	.06	.01 n.s.	.12	.02 n.s.
Mood	.02 n.s.~	.05 n.s.~	.00 n.s.	.04 n.s.	.03 n.s.	.03 n.s.	.01 n.s.
Environment	.18	.22	.14	.05	.04	.15	.07
Animal	.14	.16	.18	.09	.11	.09	.07
Social Justice	.13	.18	.11	.05	.08	.12	.08
Single-item scale							
Health	.28	.24~	.10	.02 n.s.	.01 n.s.	.13	.08
Natural	.20	.23	.14	.04 n.s.	.08	.11	.06
Appearance	.09	.09	.06	.04 n.s.	.10	.04 n.s.	.08
Taste	.10	.07	.01 n.s.	.02 n.s.~	.02 n.s. ~	.04 n.s.	.06
Weight	.17	.22	.13	.01 n.s.	.07	.12	.09
Familiarity	.06	.01 n.s.	.07	.01 n.s.	.02 n.s.	.10	.04 n.s.
Price	.02 n.s.	.00 n.s.~	.05	.05	.04 n.s.	.08	.03 n.s.
Convenience	.11	.04 n.s.	.01 n.s.	.06	.03 n.s.	.10	.02 n.s.
Mood	.13~	.12~	.03 n.s.	.01 n.s.	.00 n.s.	.05	.05
Environment	.20	.22	.16	.04 n.s.	.06	.15	.08
Animal	.13	.15	.18	.12	.15	.07	.02 n.s.
Social Justice	.18	.21	.13	.06	.09	.13	.03 n.s.

Note. The green areas show the highest predictive values within a product category, and the orange areas show the lowest.
n.s. indicates that the regression analyses refer to an insignificant predictive model.
~ indicates that Fisher's z tests reveal that the regression coefficients are significantly different $p < .05$.

Table 5. Correlation coefficients single- and multi-item FCQs Study 2b.

	***M* single item**	**FCQ_ health**	**FCQ_ mood**	**FCQ_ convenience**	**FCQ_ sensory**	**FCQ_ natural**	**FCQ_ price**	**FCQ_ weight**	**FCQ_ familiar**	**FCQ_ environment**	**FCQ_ animal**	**FCQ_ social justice**
M		5.28	4.70	4.98	5.45	5.10	4.97	4.77	4.16	4.69	4.97	5.14
S_health	5.68	.769**	.333**	.142**	.309**	.621**	.080**	.546**	.150**	.521**	.462**	.505**
S_mood	5.23	.384**	.667**	.302**	.524**	.347**	.168**	.298**	.388**	.341**	.323**	.335**
S_convenience	5.03	.162**	.389**	.768**	.321**	.089**	.418**	.248**	.428**	.149**	.131**	.129**
S_sensory	5.63	.301**	.399**	.261**	.673**	.322**	.156**	.228**	.279**	.258**	.279**	.292**
S_natural	5.40	.659**	.345**	.138**	.337**	.776**	0.032	.416**	.217**	.637**	.598**	.605**
S_price	5.69	.191**	.269**	.380**	.329**	.134**	.623**	.219**	.264**	.122**	.105**	.144**
S_weight	4.92	.584**	.402**	.261**	.273**	.400**	.173**	.776**	.277**	.389**	.336**	.342**
S_familiar	4.54	.184**	.409**	.425**	.354**	.156**	.269**	.258**	.730**	.175**	.143**	.153**
S_environment	5.05	.584**	.339**	.140**	.277**	.629**	0.026	.392**	.225**	.833**	.745**	.772**
S_animal	5.19	.516**	.314**	.123**	.293**	.585**	0.003	.337**	.179**	.716**	.849**	.748**
S_social justice	4.89	.558**	.343**	.133**	.259**	.602**	0.028	.383**	.229**	.789**	.728**	.798**

*Note. The grey areas show proposed higher coefficients (convergent validity); FCQ refers to the multi-item scale for food choice motives (Steptoe et al., 1995); S_ refers to the single-item scale for food choice motives; * = p < .05, **= p < .001.*

Table 6. Separate regression analyses (R and R^2) for each multiple- and single-item motive with different product categories (Study 2b).

		vegetable		**fruit**		**meat**		**meat replacement**		**takeaway**	
Multi-item	**Single-item**	**Multi-item**	**Single-item**	**Multi-item**	**Single-item**	**Multi-item**	**Single-item**	**Multi-item**	**Single-item**	**Multi-item**	**Single-item**
health	health	.08	.06	.09	.08	.01	.01	.01	.01	.01	.01
natural	natural	.04	.03	.04	.04	.02	.02	.01	.01	.01	0
sensoric	sensoric	0	0	0	0	.01	0	0	0	0	0
weight	weight	.02	.02	.03	.03	.01	.01	.01	.01	0	0
familiair	familiair	.02	.01	0	0	0	0	0	0	.03	.02
price	affordable	.01	0	.01	0	0	0	0	0	.02	0
convenience	convenience	.02	.01	.01	0	0	0	.01	0	.05	.03
mood	feel good	0	0	0	0	0	0	.01	0	.01	.01
environment	environment	.03	.03	.03	.03	.02	.03	.02	.02	0	0
animal friendly	animal friendly	.02	.02	.02	.02	.04	.03	.03	.02	0	0
fair trade	fair trade	.02	.02	.02	.03	.02	.02	.01	.01	0	.00

Note. The green areas show the highest predictive values within a product category, and the orange areas show the lowest.

Table 7. Correlation coefficients single- and multi-item FCQs Study 2c.

		FCQ_ health	**FCQ_ mood**	**FCQ_ convenience**	**FCQ_ sensory**	**FCQ_ natural**	**FCQ_ price**	**FCQ_ weight**	**FCQ_ familiar**	**FCQ_ environment**	**FCQ_ animal**	**FCQ_ social justice**
M		4.98	4.33	4.98	5.22	4.51	5.21	4.40	4.45	4.22	4.26	4.48
S_health	5.30	.753**	.331**	.219**	.420**	.586**	.163*	.459**	.234**	.453**	.348**	.419**
S_mood	4.01	.376**	.692**	.388**	.355**	.356**	.051	.468**	.464**	.424**	.385**	.330**
S_convenience	5.09	.074	.216**	.501**	.299**	.035	.358**	.175**	.302**	.016	.118	.057
S_sensory	5.29	.283**	.303**	.277**	.603**	.144*	.283**	.178**	.299**	.144*	.209**	.220**
S_natural	4.65	.645**	.452**	.234**	.427**	.771**	0.093	.303**	.318**	.649**	.585**	.604**
S_price	5.67	.189**	0.050	.375**	.285**	.033	.552**	.032	.091	-.071	-.029	.049
S_weight	4.77	.605**	.467**	.311**	.403**	.380**	.117	.748**	.295**	.405**	.359**	.317**
S_familiar	4.80	.224**	.433**	.382**	.276**	.220**	.121	.258**	.640**	.158*	.134*	.120
S_environment	4.29	.475**	.461**	.093	.275**	.602**	-.026	.362**	.241**	.786**	.682**	.727**
S_animal	3.71	.421**	.437**	.189**	.238**	.469**	-.002	.402**	.350**	.677**	.773**	.662**
S_social justice	4.07	.396**	.439**	.116	.212**	.555**	-.050	.278**	.230**	.683**	.534**	.597**

*Note. The grey areas show proposed higher coefficients (convergent validity); FCQ refers to the multi-item scale for food choice motives (Steptoe et al., 1995); S_ refers to the single-item scale for food choice motives; * = p < .05, ** = p < .001.*

Table 8. Separate regression analyses (R and R^2) for each multiple- and single-item motive with different product categories (Study 2c).

	vegetable		fruit	
	Multi-item	**Single-item**	**Multi-item**	**Single-item**
health	.25	.272	.194	.196
natural	.111	.12	.088	.088
sensoric	.154	.04	.111	.033
weight	.092	.117	.08	.072
familiair	.003	.001	.01	.004
affordable	.031	.031	.02	.028
convenience	.022	.004	.011	0
mood	.021	.001	.024	0
environment	.118	.055	.108	.051
animal friendly	.073	.034	.05	.038
fair trade	.127	.032	.083	.048

Note. The green areas show the highest predictive values within a product category, and the orange areas show the lowest.

Table 9. Proposed single-item Food Choice Questionnaire

Proposed single-item FCQ
It is important to me that the food I eat on a typical day is…*
healthy
is a way of monitoring my mood (e.g., a good feeling or coping with stress')[1]
is convenient (in buying and preparing) [2]
provides me with pleasurable sensations (e.g., texture. appearance. smell and taste)[3]
is natural
is affordable
helps me control my weight
is familiar
is environmentally friendly
is animal friendly
is fairly traded

**Answering categories on a Likert scale (1=not at all important; 7=very important).*

Table 10. Mean scores for the multi-item scale for general food choice and single-item scale for specific contexts (Study 3).

			Dinner			Snack		
Multi-item scalement		**Single-item scalement**	**home**	**Work/school**	**On the move**	**home**	**Work/school**	**On the move**
Sensory	5.74	Taste	6.37	6.15[a]	6.14[a]	6.20	6.11[a, b]	6.09[b]
Health	5.58	Health	6.09	5.87	5.79	5.72[a]	5.72[a]	5.59
Mood	5.07	Mood	6.03	5.87[a]	5.85[a]	5.89[a]	5.83[a]	5.78
Natural	5.60	Natural	5.85	5.65	5.58[a]	5.58[a]	5.55[a]	5.45
Price	5.45	Price	5.62[a]	5.63[a]	5.59[a, b]	5.55[b]	5.62[a]	5.57[a, b]
Convenience	5.27	Convenience	5.61	5.80[a]	5.76[b]	5.71[b]	5.82[a]	5.83[a]
Environment	5.12	Environment	5.33	5.26[a]	5.21[a, b]	5.22[a]	5.19[a, b]	5.14[b]
Weight	4.91	Weight	5.30	5.20	5.12[a]	5.11[a]	5.09[a]	4.99
Familiarity	4.62	Familiarity	5.16	5.04	4.97[a]	5.02[a]	4.97[a, b]	4.91[b]

Appendix I: Proposed single-item FCQ items and dimensions for original and extended FCQ

Proposed single-item FCQ	**Dimensions of Steptoe et al.. (1995)**	**Dimensions of Lindeman and Vaänanen (2000)**
It is important to me that the food I eat on a typical day is…		
healthy	health	
is a way of monitoring my mood (e.g.. a good feeling or coping with stress') [1]	mood	
is convenient (in buying and preparing) [2]	convenience	
provides me with pleasurable sensations (e.g.. texture. appearance. smell and taste)[3]	sensory appeal	
is natural	natural content	
is affordable	price	
helps me control my weight	weight control	
is familiar	familiarity	
is environmentally friendly	ethical concern	environmental protection
is animal friendly		animal welfare
is fairly traded		political values
		religion

[1] *Note that Studies 1, 2a, 2b and 3 used* 'makes me feel good' *though Study 3b indicated that the abovementioned item provides better results for measuring mood.*
[2] *Note that in Study 1, 'is easy to prepare' was used.*
[3] *Note that Studies 1 and 2a used 'is tasty' and 'looks good', and Study 2c used 'is tasty'. However, Study 2b indicated that the abovementioned item provides better results for measuring sensory appeal.*

Appendix II: Original and extended FCQ items for the multi-item measure

Steptoe et al.. (1995)	**Lindeman and Vaänanen (2000)**	**Verain et al.. (2016a)**
Health	Animal Welfare	Environmental welfare
Contains many vitamins and minerals	**Has been produced in a way that does not inflict pain on animals**	**…has environmentally friendly packaging.**
Keeps me healthy	**Has been produced in a way in which animals' rights have been respected**	**…produced in an environmentally friendly manner.**
Is nutritious		**…is produced with a minimum of Co2 emissions**
Is high in protein		**…is organic.**
Is good for my skin/teeth/hair/nails. etc.	Environmental Protection	…is produced without pesticides.
Is high in fibre and roughage	**Has been prepared in an environmentally friendly way**	…is produced within the season
	Has been produced in a way that	
Mood	has not disrupted the ecosystem	
Helps me cope with stress[1, 2a, 2b]	**Is packaged in an environmentally friendly way**	
Helps me to cope with life[2a]		
Helps me relax[1, 2a, 2b]	Political Values	Animal welfare
Keeps me awake/alert	Comes from a country of which I approve politically	**..produced with sufficient freedom of movement for animals.**
Cheers me up[1, 2b]	Comes from a country in which human rights are not violated	**…is animal friendly.**
Makes me feel good[1, 2b]	Has the country of origin clearly marked	…produced via free-range.
	Has been prepared in a way that does not conflict with my political values	
Convenience		
Is easy to prepare	Religion	Social justice
Can be cooked very simply	Is not forbidden in my religion	**…Produced in a humane way.**
Takes no time to prepare	Is in harmony with my religious views	**…produced without child labour.**
Can be bought in shops close to where I live or work		**…produced without exploitation.**
Is easily available in shops and supermarkets		…is fair trade.
Sensory Appeal		
Smells nice		
Looks nice		
Has a pleasant texture		
Tastes good		
Natural Content		
Contains no additives		
Contains natural ingredients		
Contains no artificial ingredients		
Price		
Is not expensive		
Is cheap		
Is good value for the money		

Weight Control
Is low in calories
Helps me control my weight
Is low in fat
Familiarity
Is what I usually eat
Is familiar
Is like the food I ate when I was a child
Ethical Concern
Comes from countries I approve of politically
Has the country of origin clearly marked
Is packaged in an environmentally friendly way

Note. The bolded items refer to the items that were included in Studies 1, 2a and 2b. For mood, the superscript numbers indicate in which study they were included. Studies 2c and 3 used all original Steptoe items.