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1 **Correlates of food choice in unemployed young people: the role of demographic factors,**
2 **self-efficacy, food involvement, food poverty and physical activity**

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14

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19

20 **Abstract**

21 Associations between socio-demographic and psychological factors and food choice patterns
22 were explored in unemployed young people who constitute a vulnerable group at risk of poor
23 dietary health. Volunteers (N=168), male (n=97) and female (n=71), aged 15-25 years were
24 recruited through United Kingdom (UK) community-based organisations serving young
25 people not in education training or employment (NEET). Survey questionnaire enquired on
26 food poverty, physical activity and measured responses to the Food Involvement Scale (FIS),
27 Food Self-Efficacy Scale (FSS) and a 19-item Food Frequency Questionnaire (FFQ). A path
28 analysis was undertaken to explore associations between age, gender, food poverty, age at
29 leaving school, food self-efficacy (FS-E), food involvement (FI) (kitchen; uninvolved;
30 enjoyment), physical activity and the 4 food choice patterns (junk food; healthy; fast food;
31 high fat). FS-E was strong in the model and increased with age. FS-E was positively
32 associated with more frequent choice of healthy food and less frequent junk or high fat food
33 (having controlled for age, gender and age at leaving school). FI (kitchen and enjoyment)
34 increased with age. Higher FI (kitchen) was associated with less frequent junk food and fast
35 food choice. Being uninvolved with food was associated with more frequent fast food choice.
36 Those who left school after the age of 16 years reported more frequent physical activity. Of
37 the indirect effects, younger individuals had lower FI (kitchen) which led to frequent junk
38 and fast food choice. Females who were older had higher FI (enjoyment) which led to less
39 frequent fast food choice. Those who had left school before the age of 16 had low food
40 involvement (uninvolved) which led to frequent junk food choice. Multiple indices implied
41 that data were a good fit to the model which indicated a need to enhance food self-efficacy
42 and encourage food involvement in order to improve dietary health among these
43 disadvantaged young people.

44 **Key words:** Young people; NEET; Survey; Path Analysis; Food Choice; FFQ; Self-Efficacy;
45 Food Involvement; Food Poverty.

46

47 **1. Introduction**

48 A substantial proportion (9.7%) of young Europeans aged 15-24 years, are currently
49 unemployed (EU Labour Force Survey, 2-12). Although education is mandatory up to the age
50 of sixteen years, the number of young people in the United Kingdom who leave mainstream
51 education at the age of 16 years and who are not in education, employment or training
52 (NEET) is increasing (Institute for Public Policy Research, 2010) with as many as 13% of 16-
53 19 year olds in Northern Ireland (NI) unemployed (Department of Employment & Learning,
54 2010; Bennett, 2010; Monteith, Lloyd & McKee, 2008). Most research directed toward
55 understanding young people's food choices has been conducted within the school
56 environment (Shepherd Harden, Rees et al., 2006). Unemployed young people, however,
57 constitute a vulnerable group who have been under-researched and who may be especially at
58 risk of adverse health behaviour and outcomes (McCoy, Kelly & Watson, 2007) and who
59 may be especially at risk of inadequate diet (Ball, MacFarland, Crawford et al., 2009).
60 Previous research has suggested that young people have a tendency toward consumption of
61 'junk' (energy dense/low nutrient) food (Share & Stewart-Knox, 2012; Fraser, Edwards,
62 Cade et al., 2011a; Fraser, Clarke, Cade et al., 2011b; Kerr, Rennie, McCaffrey et al., 2009;
63 Larson, Neumark-Sztainer, Story et al., 2008) which increases through adolescence (Larson et
64 al., 2008) and is associated with socio-economic deprivation (Fraser et al., 2011a).

65 Young people's food choices are multifactorally determined (Story, Neumark-
66 Sztainer & French, 2002) and include socio-demographic factors (Share & Stewart-Knox,
67 2012; Shepherd et al., 2006) and physical activity, which declines during the transition from
68 adolescence to adulthood (Pearson & Biddle, 2011; de Vet, de Ridder & de Wit, 2011).
69 Qualitative studies of disadvantaged young people aged 15-24 years in Australia (Crawford et
70 al., 2014; Booth, 2006) and the UK (Davison, Share, Hennessy et al., 2014) have also
71 indicated that such young people experience a considerable degree of food insecurity and that

72 this is at least in part, a result of structural barriers to the access of healthy food (Davison et
73 al., 2014; Crawford et al., 2014).

74 Psychological factors are also likely to determine food choice in young people. Self-
75 efficacy, a key psychological construct in Social Cognitive Theory, is defined as an
76 individual's perceived ability to achieve a desired outcome (Bandura, 1995). Self-efficacy
77 has been found to be associated with eating behaviour among young people residing in
78 Ireland (Fitzgerald, Heary, Kelly et al., 2013), the UK (Lubans, Plotnikoff, Morgan et al.,
79 2012), the USA (Franko, Cousineau, Rodgers et al., 2013; Kinnard & Webster, 2012;
80 Granner & Evans, 2012; Bruening, Kubik, Kenyon et al., 2010) and Australia (Pearson, Ball
81 & Crawford, 2012; Pearson, Ball & Crawford, 2011). Food involvement, defined as 'the level
82 of importance of food in a person's life' (Bell & Marshall, 2003 pp236) appears lacking
83 among young people (Watt & Sheiham, 1996) and has been found to be associated with
84 healthier eating in adolescents in the USA (Laska, Larson, Neumark-Sztainer et al., 2012;
85 Larson, Perry, Story et al., 2006). UK research has suggested that educational attainment is
86 associated with food involvement particularly that which is concerned with food purchase,
87 preparation and choice (Bell and Marshall, 2013). There is also evidence that this impacts
88 upon food choice. Women who have spent less time in education report lower food
89 involvement and less fruit and vegetable consumption (Jarman, Lawrence, Ntani et al., 2012).

90 There appear to be no previously published surveys of unemployed young people that
91 have considered food choice. Those surveys which exist have focussed upon nutrient intake
92 (Mark, Lambert, O'Loughlin et al., 2012) or acquisition of food through welfare agencies
93 (Booth, 2006) rather than food choice *per se*. Given that both the prior qualitative research
94 (Davison et al., 2014; Share et al., 2013) and previous studies have indicated that young
95 peoples' food choices are associated with physical activity (Pearson & Biddle, 2011; de Vet;
96 de Ridder & de Wit, (2011), food poverty (Crawford et al., 2014; Mark et al., 2012; Booth,

97 2006), self-efficacy (Fitzgerald et al., 2013; Franko et al., 2013; Lubans et al., 2012; Kinnard
98 & Webster, 2012; Granner & Evans, 2012; Pearson et al., 2012; Bruening et al., 2010) and
99 food involvement (Bell and Marshall, 2013; Laska et al., 2012; Jarman et al., 2012; Larson et
100 al., 2006), items reflecting these issues have been included in the questionnaire. The aim of
101 this study has been to determine intervention needs among young people not in education,
102 employment or training, a purpose that has also informed selection of items and constructs
103 for inclusion. No previous studies appear to have considered the above factors *together* as
104 potential correlates of dietary habits in young people. This survey, therefore, sought to
105 understand the degree to which self-efficacy, food involvement, physical activity, age at
106 leaving school and food poverty were associated with food choice patterns in this important,
107 disadvantaged, under-researched group of young people. It is anticipated that the results will
108 inform policy toward addressing dietary health related inequality among these young people.

109

110 **2. Method**

111 The study was of a cross-sectional, self-complete survey design.

112 **2.1. Sampling**

113 The study took place in Northern Ireland (UK). Community-based organisations with
114 a remit to enable young people to get into education or employment or training were
115 considered eligible to participate. Initial contact with youth and training service providers
116 was via telephone. Of the thirteen organisations contacted, all agreed to participate. All young
117 people attending each centre on the day of data collection freely volunteered to take part and
118 give of their time to complete the questionnaire. There were no refusals.

119

120 **2.2. Questionnaire**

121 Self-administered questionnaire was used to record demographic characteristics, food
122 choices, physical activity, food poverty, food involvement and self-efficacy. Questionnaire
123 content was informed by prior qualitative studies (Share et al., 2013) and review of the
124 literature on food issues in young people.

125

126 **2.3. Procedure**

127 Ethical approval was granted by the University Research Ethical Committee. The
128 survey was piloted on a sub-sample ($n=12$). There appeared to be confusion over the
129 meaning of the response option ‘somewhat confident’ in the self-efficacy scale. The wording
130 of the item, therefore, was changed to ‘a little confident’. Data collection took place in youth
131 service provider organisations located in greater Belfast and Counties Armagh, Antrim and
132 Londonderry during November and December 2011. Informed consent was obtained from
133 the young people prior to completion of the questionnaire. Parental consent was not required
134 given nearly half (47%) were living independently and all were over the age of consent which
135 is 16 years in the UK. In the interests of confidentiality, no names were recorded. The
136 questionnaire was completed in groups of five to six in a quiet room within the premises of
137 the respective organisation. Prior to completion of the questionnaire, the researcher read
138 aloud an information sheet, detailing the questions and explaining the response formats to
139 each scale. The questionnaire took 15 to 20 minutes to complete.

140

141 **2.4. Data Analysis**

142 **2.4.1. Preliminary Analyses**

143 Exploratory factor analysis was conducted on the Food Frequency Questionnaire (FFQ),
144 Food Involvement Scale (FIS) and Food Self Efficacy Scale (FSES) using the statistical
145 software package SPSS (version 19). Maximum likelihood estimation was used along with a
146 promax factor rotation. The Bartlett method was used for the factor scores as this procedure
147 produces unbiased estimates of the true scores (Hershberger, 2005).

148

149 *2.4.1.1. Food Frequency Questionnaire (FFQ)*

150 The 19-item food frequency questionnaire (FFQ) previously employed in the WHO
151 Health Behaviour of School Children (HBSC) Survey (Nic Gabhainn, Kelly & Molcho,
152 2007) was used to assess the frequency consumption of a variety of food: fruit; vegetables;
153 sweets; cheese; other dairy (yoghurt); crisps; chips/fried potatoes; white bread; wholemeal
154 bread; cake; biscuits; burgers/sausages; fish; and drinks: low fat milk; whole milk; cola
155 and/or other sugar sweetened soft drinks; diet soft drinks; stimulant/energy drinks; and,
156 alcohol. Respondents were asked to indicate ‘How many days per week do you usually eat or
157 drink ...’, on a 0-6-point Likert scale ranging from: never; less than once a week; once a
158 week; 2 to 4 days per week; 5 to 6 days per week; once a day, every day; and every day, more
159 than once.

160 Exploratory factor analysis was conducted on the Food Frequency Questionnaire to
161 determine food choice patterns (Table 1). A maximum likelihood extraction method was
162 employed with a promax rotation solution which identified 4 food choice factors on the
163 criterion of having an eigenvalue greater than 1 (Table 2). Items with a loading magnitude
164 greater than or equal to 0.40 (Table 1): 1) ‘junk food’; 2) (5 items - sweets, cola, crisps,
165 chips/fried potatoes, biscuits and white bread); 3) ‘healthy food’ (4 items - fruit, vegetables,
166 wholemeal bread and fish); 4) ‘fast food’ (2 items - energy drinks/burgers/sausages); 5) ‘high
167 fat food’ (2 items – cake, burgers/sausages); 6). Yogurt and whole milk each loaded onto

168 factors in which they were the only items, therefore, were excluded from further analysis.
169 The item burgers/sausages loaded onto both the ‘fast food’ and ‘high fat’ factors. This item
170 was retained within both factors given that burgers/sausages are sold via fast food outlets and
171 contain high amounts of fat.

172

173 **Insert Tables 1 and 2**

174

175 *2.4.1.2. Food Involvement Scale*

176 Attitudes to food, eating and cooking were assessed using the 12-item Food
177 Involvement Scale (Bell & Marshall, 2013). Respondents were asked to indicate on a 5-point
178 Likert scale ranging from strongly agree (5) to strongly disagree (1) responses to the
179 statements: I don’t think much about food each day; cooking or barbequing is not much fun;
180 Talking about what I ate or am going to eat is something I like to do; Compared with other
181 daily decisions my dietary habits are not very important; When I travel one of the things I
182 anticipate most is eating the food there; I do most or all of the clean up after eating; I enjoy
183 cooking for others and myself; When I eat out I don’t think or talk much about how the food
184 tastes; I do not like to mix or chop food; I do most or all of my own food shopping; I do not
185 wash dishes or clean the table; I care whether or not a table is nicely set.

186 Exploratory factor analysis using maximum likelihood extraction method with a
187 promax rotation solution was employed on the Food Involvement Scale (Table 3). Factor
188 analysis confirmed a three-factor solution with factor scores greater than or equal to 0.40
189 eigenvalues: ‘kitchen’ (2 items - I do most or all of the clean up after eating; and, I do not
190 wash dishes or clean the table); ‘uninvolved’ (3 items - I don’t think much about food each
191 day; compared with other daily decisions, my food choice habits are not very important; and,

192 when I eat out, I don't think or talk much about how the food tastes. 'enjoyment' (3 items -
193 talking about what I ate or am going to eat is something I like to do; when I travel one of the
194 things I anticipate most is eating the food there; and, I enjoy cooking for others and myself.

195

196 **Insert Table 3**

197

198 *2.4.1. 3. Food Self-Efficacy Scale*

199 The 6-item Food Self-Efficacy Scale (Ball et al., 2009) was used to assess self-
200 efficacy on a 4-point scale: not at all confident (1); a little confident (2); confident (3); and,
201 very confident (4) in their ability to reduce junk food and increase fruit consumption across
202 three different situations: when hanging out with friends; when at training/work; and, when at
203 home (Table 4).

204 This was entered using a latent variable technique to test a 1-factor model which was
205 taken as a good description of the model.

206

207 **Insert Table 4**

208

209 *2.4.1.4. Physical Activity*

210 The short-form International Physical Activity Questionnaire (IPAQ) (The IPAQ
211 Group, 2001) was employed to measure physical activity: 'during the last 7 days, how many
212 days did you engage in: moderate-intensity activities; vigorous-intensity activities; and
213 walking?' Although the IPAQ has been shown to have acceptable levels of validity and

214 reliability for a self-reported measure, it tends to overestimate physical activity in comparison
215 to objective measures (Lee et al., 2011). Owing to a relative lack of vigorous-intensity
216 activity in our sample, only moderate-intensity activity was entered into the analysis.

217

218 2.4.1.5. *Food Poverty*

219 A single measure was derived from the Health Behaviour in School-Aged Children
220 Survey (HBSC) (Nic Gabhainn, Kelly & Molcho, 2007) to enquire on food poverty: ‘Some
221 young people go to school/work/training or to bed hungry because there is not enough food at
222 home. How often does this happen to you?’ Responses were ‘how often (always, often,
223 sometimes or never) they went (during the day and/or to bed) hungry because there was not
224 enough food at home?’ This item has been shown to have face and content validity for use
225 with children (Nielsen, Molcho, Arnfjord et al., 2013).

226

227 2.4.2. *Path Analysis*

228 A path analysis was then conducted using the *Mplus* Ver. 7.11 (Muthen & Muthen ©
229 1998-13) to explore relationships between: age (continuous – mean centred at zero); gender
230 (dichotomous); age left school (pre/post 16 years old) (dichotomous); food poverty
231 (continuous); self-efficacy (continuous); food involvement (kitchen; uninvolved; enjoyment);
232 physical activity (continuous); and, frequency of food consumption patterns (junk food;
233 healthy food; fast food; and, high fat food). The robust maximum likelihood (MLR) was
234 used to estimate model weights. Goodness-of-fit was assessed using the *chi-Square* test of
235 model fit, the comparative fit index (CFI) and the root mean square error of approximation
236 (RMSEA) and the standardised root mean square residual (SRMR) which takes into account
237 the degrees of freedom of the model. A CFI greater than 0.95 (Hu & Bentler, 1999), a SRMR

238 of below 0.05 and an RMSEA of less than 0.08 (Browne & Cudeck, 1993) are considered
239 acceptable.

240

241 **3. Results**

242 ***3.1. Sample Characteristics***

243 A total of 168 young people, 97 male and 71 female, aged between 15 and 25 years
244 (mean age = 18.39 years; standard deviation = 2.756) completed the survey. Despite
245 education being mandatory until the age of 16 years, more than a third of the sample 35%
246 ($n=59$) left school before the age of 16 years. At the time of data collection 23% ($n=40$) were
247 living independently, 7.1% ($n=12$) were living with their children and 16.1% ($n=27$) lived in
248 a care-home or hostel. More than half (56%) reported that they ‘never’ went to
249 school/work/training or to bed hungry because there is not enough food at home’, nearly one
250 third (31%) reported ‘sometimes’, 8% reported ‘often’ and 5% ‘always’. Nearly two-thirds
251 (60%) reported engaging in moderate-intensity physical activity on at least one of the
252 previous seven days.

253

254 ***3.2. Correlates of Food Choice Patterns***

255 The path analysis was based on the model shown in figure 1. Gender (dichotomous);
256 age (continuous); leaving school (dichotomous - before or after age 16 yrs); and, food
257 poverty were treated as contextual, exogenous fixed variables which were entered into the
258 model first. Food involvement (low involvement; kitchen; enjoyment) and physical activity
259 (continuous) were entered as intervening variables. Food self-efficacy (continuous) was
260 entered as a latent variable. The outcome variables were food choice patterns (junk food; fast

261 food; healthy; high fat). From the fit indices (CFI = 0.95; TLI = 0.91; RMSEA = 0:05; SRMR
262 = 0.05) it was concluded that there was little discrepancy between the original data and the
263 model and that the model (N=166) fitted these data well. The *chi-Square* test of model fit,
264 which was used to compare raw data with re-computed data, indicated that they were a
265 reasonable description of these data ($X^2=119.20$, $df=80$, $p=0.003$). Food self-efficacy was
266 particularly strong in the model (Table 5).

267

268 **Insert Table 5**

269

270 *3.2.1. Food Self-Efficacy and Food Choice Pattern*

271 Food self-efficacy was age-dependent such that for every year above the sample
272 average age (set at zero) there was a significant increase in self-efficacy (Figure 1). There
273 were no direct associations between gender and having left school before or after 16 years,
274 food poverty or food self-efficacy (FSE).

275 Those higher on food self-efficacy reported consuming the junk food or high fat food
276 choice pattern less frequently and the healthy pattern more frequently, even when controlling
277 for the exogenous measures in the analysis. Food self-efficacy was not associated with the
278 fast food choice pattern (Table 6).

279

280 **Insert Table 6**

281

282 *3.2.2. Food Involvement and Food Choice Pattern*

283 Food involvement (kitchen and enjoyment) increased with age. Those scoring higher
284 on food involvement (kitchen) reported less frequent choice of the junk food pattern (Table

285 6). Those higher on food involvement (enjoyment) also reported less frequent choice of the
286 fast food choice pattern. Those who scored higher on food involvement (kitchen) reported
287 more frequent choice of the fast food pattern. Higher scores on food involvement
288 (uninvolved) were associated with more frequent choice of the fast food pattern.

289 There were no associations between food involvement (low involvement or
290 enjoyment) and choice of the high fat or healthy food choice pattern or between food
291 involvement (kitchen) and the high fat food choice pattern (Figure 1).

292

293 **Insert figure 1 here**

294

295 *3.2.3. Physical Activity and Food Choice Pattern*

296 Having left school after the age of 16 years was associated with more frequent
297 physical activity (Table 6). Frequency of physical activity was not associated with food-self-
298 efficacy, food involvement or any of the food choice frequency patterns (Figure 1).

299

300 *3.2.4. Indirect Effects on Food Choice Pattern*

301 *3.2.4.1. Gender*

302 The total (standardised) effect of gender was associated with the fast food choice
303 pattern via food involvement (enjoyment) (Est/SE = -1.081; $P = 0.037$). Females were higher
304 in food involvement (enjoyment) which led to less frequent fast food choice (Figure 1).

305

306 *3.2.4.2. Age*

307 For every year younger than the mean age there was an effect of -0.604 on junk food
308 choice. Being younger led to more frequent choice of the junk food via lower food

309 involvement (kitchen) (Est/SE = -0.933; $P = 0.018$). Those who were younger had lower
310 kitchen involvement which led to more frequent junk food choice (Figure 1)

311 Being younger was associated with more frequent fast food choice (Est/SE = -0.298;
312 $P = 0.001$). This effect was via food involvement (kitchen) (Est/SE = 0.300; $P = 0.025$).
313 Those who were younger had lower food involvement (kitchen) which led to more frequent
314 fast food choice (Figure 1)

315 Being younger was associated with more frequent fast food choice via food
316 involvement enjoyment (Est/SE = -0.582; $P = 0.001$). Those who were younger had lower
317 food involvement (enjoyment) which led to more frequent fast food choice (Figure 1).

318

319 *3.2.4.3. Left School Before/After Age 16 Years*

320 Having left school before the age of 16 years was associated with the more frequent junk
321 food choice pattern (Est/SE = -3.275; $P = 0.010$). This effect was via food involvement
322 (kitchen) (Est/SE = -4.145; $P = 0.053$) such that those who had left school before the age of
323 16 were less involved in the kitchen which led to more frequent junk food choice (Figure 1).

324

325 **4. Discussion**

326 This analysis sought to determine the degree to which socio-demographic factors, food
327 poverty, physical activity, food involvement and food self-efficacy were associated with food
328 choice patterns in this unemployed group of young people. The frequency with which food
329 was chosen aligned with four patterns (healthy; junk food; fast food; and, high fat). As
330 suggested by previous research conducted on Irish (Fitzgerald et al., 2013; Share & Stewart-
331 Knox, 2012; Kerr et al., 2009) and other young people (Fraser et al., 2011b; Larson et al.,
332 2008), a substantial proportion frequently consumed 'junk food' or 'fast food'.

333 As indicated by previous (school based) studies of the young conducted in Ireland
334 (Fitzgerald et al., 2013), Australia (Lubans et al., 2012; Pearson, Ball & Crawford, 2012) and
335 the USA (Kinard & Webster, 2012; Granner & Evans, 2012; Bruening et al., 2010) self-
336 efficacy was an important correlate of food choice patterns among this group of young
337 people. The food self-efficacy scale showed high reliability and was very strong in the path
338 model implying we can have confidence in the measure. Higher food self-efficacy was
339 associated with the healthy food choice pattern and lower self-efficacy with the junk food and
340 high fat food choice patterns, even when controlling for age, gender and whether left school
341 before or after the age of 16 years. Food self-efficacy, however, was age-dependent. For
342 every year above the sample average age (set at zero) there was a significant increase in self-
343 efficacy. Together, these data and previous studies emphasise the need for intervention to
344 encourage food-related self-efficacy in young people, particularly those who are younger and
345 those who leave mainstream education prior to or at the age of 16 years. That having low
346 self-efficacy was associated with more frequent junk and high fat food choices corroborates
347 the growing body of research which suggests that self-efficacy may hold the key to
348 compliance with healthy eating recommendations among the young (Fitzgerald et al., 2013;
349 Pearson, Ball & Crawford, 2012; Lubans et al., 2012; Kinard & Webster, 2012; Granner &
350 Evans, 2012; Bruening et al., 2010).

351 Food involvement (kitchen and enjoyment) increased with age implying that dietary
352 health promotion initiatives should be targeted at younger school leavers. Consistent with
353 previous research (Laska et al., 2012; Larson et al., 2006) suggesting that involvement with
354 food is associated with better dietary quality, those scoring lower on food involvement
355 (kitchen) reported more frequent choice of junk food. Also as expected was that being
356 'uninvolved' with food was associated with more frequent consumption of the fast food
357 choice pattern. The finding that those higher on food involvement (kitchen) chose the fast

358 food pattern more frequently, however, was unexpected. A possible explanation is that those
359 who were more involved in kitchen-related, for example, cleaning up activities, sought to
360 avoid them by acquiring fast food. Intervention to reduce fast food consumption, therefore,
361 should seek to engage young people with food that is quick and easy to prepare and which
362 requires minimal cleaning up. That being high on food ‘enjoyment’ was associated with less
363 frequent fast food choice and indicates that intervention to reduce fast food choice in this
364 group should portray healthy eating as a fun activity.

365 There were some indirect pathways exogenous variables (age; gender; left school
366 pre/post age 16 yrs; food poverty - going hungry) via the intervening variables (food
367 involvement (FI) (kitchen; uninvolved; enjoyment), physical activity and the latent factor of
368 food self-efficacy (FS-E) on the food choice patterns (junk; fast food; healthy; high fat)
369 (outcome measures). Although females tended to score high on food involvement enjoyment,
370 and chose fast food less frequently, if younger, higher food involvement (enjoyment) led to
371 more frequent fast food choice. This suggests that food involvement, particularly those
372 aspects surrounding enjoyment of the eating experience interact with food choice differently
373 between males and females depending upon age. That high ‘enjoyment’ may drive choice of
374 fast foods in younger females implies a need for healthy fast-food options to be made
375 available to this group.

376 Age was an important indirect determinant of food choice. Being younger was also
377 associated with lower food involvement (kitchen) which led to more frequent choice of the
378 junk food. Those who were younger scored lower on the ‘enjoyment’ food involvement
379 factor which led to more frequent fast food choice. Together, these findings imply that dietary
380 health promotion efforts to be most effective should target the youngest school leavers and
381 promote healthy foods that are enjoyable to eat and that are quick and easy to prepare. At the

382 same time efforts should be directed toward enhancing the enjoyment associated with food
383 and increasing involvement in the kitchen.

384 Despite education being mandatory until the age of 16 years, more than a third of the
385 sample reported having left school prior to this age. Those who had left school before the age
386 of 16 may be especially prone to making less healthy food choices. According to the findings
387 of this study, they were uninvolved with food which led to frequent junk food choice. In
388 testament to the economically deprived circumstances in which these young people existed,
389 more than a third reported going to bed hungry ‘often’ or ‘always’. Contrary to research
390 conducted in Australia (Ball et al., 2009) and in Canada (Mark et al., 2012) suggesting that
391 food poverty is associated with less healthy food choices, food poverty was not associated
392 either directly or indirectly with any of the food choice patterns among our sample. This
393 apparent disparity may reflect differences in how different studies have assessed food poverty
394 and/or food intake.

395 Previous reviews of studies of food and health in adolescents and young people (de
396 Vet, de Ridder & de Wit, 2011) have concluded that whereas greater physical activity is
397 positively related to dietary healthfulness, sedentary behaviour tends to be associated with
398 lower consumption of fruit and vegetables and higher consumption of energy dense food and
399 drink. It was unexpected, therefore, to find that the frequency with which physical activity
400 was undertaken was not associated with food-self-efficacy, food involvement or indeed any
401 of the food choice frequency patterns in these young people. Physical activity was less
402 frequent among those who had left school before the age of 16 years which agrees with
403 previous research indicating that school leavers who do not enter tertiary education are less
404 likely to engage in physical activity than those who continue in full-time education (Simons,
405 Rosenberg, Salmon et al. 2015).

406 Conclusions should also take into account the bias inherent in self-reported survey
407 (Brener, Billy & Grady, 2002; Tourangeau, Rips & Rasinski, 2001; Stone et al, 2000). That
408 data were gathered by cross-sectional survey and analysed using correlational techniques
409 renders it difficult to conclude as to causality. The use of single item measures of food
410 poverty and physical activity could be considered crude (Loo, 2002; Bowling, 2005),
411 although both have been used as valid constructs in the HBSC 43-Country Study of Child
412 Health Behaviours, which has been ongoing for the last three decades (Nic Gabhainn et al.,
413 2007). Given that the target group were young people with low levels of educational
414 attainment, there was an imperative to keep questionnaire straightforward and its length to a
415 minimum. Further limitations relate to inaccuracies inherent in food choice assessment
416 (MacDiarmid & Blundell, 1998). The food frequency questionnaire employed could not
417 indicate quantity and that it showed only moderate reliability could imply that it may not
418 have fully accounted for food choices in this group. It is also possible that the degree to
419 which the findings can be generalised to other unemployed youth could be limited by the
420 relatively small sample size. Comparable studies which have looked at correlates of food
421 intake in similarly aged unemployed youth conducted in the USA (Bruening et al., 2010) and
422 Australia (Booth, 2006), however, have employed smaller samples and produced similar
423 findings.

424 Unlike previous research into food choice in young people (Shepherd et al., 2006) this
425 study has been conducted in the community rather than in schools and has considered an
426 under-researched group of young people who are not in the mainstream education system.
427 These data imply that policies are needed to promote healthy eating among those who leave
428 school prior to the age of 16 and seek to encourage food self-efficacy and food involvement.

429

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435

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