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1 Examining evidence for behavioural mimicry of parental eating by
2 adolescent females: an observational study

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24 **ABSTRACT**

25 Behavioural mimicry is a potential mechanism explaining why adolescents appear to be
26 influenced by their parents' eating behaviour. In the current study we examined whether there
27 is evidence that adolescent females mimic their parents when eating. Videos of thirty-eight
28 parent and female adolescent dyads eating a lunchtime meal together were examined. We
29 tested whether a parent placing a food item into their mouth was associated with an increased
30 likelihood that their adolescent child would place any food item (non-specific mimicry) or the
31 same item (specific mimicry) in their mouth at three different time frames, namely during the
32 same second or within the next fifteen seconds (+15), five seconds (+5) or two second (+2)
33 period. Parents and adolescents' overall food intake was positively correlated, whereby a
34 parent eating a larger amount of food was associated with the adolescent eating a larger meal.
35 Across all of the three time frames adolescents were more likely to place a food item in their
36 mouth if their parent had recently placed that same food item in their mouth (specific food
37 item mimicry), however there was no evidence of non-specific mimicry. This observational
38 study suggests that when eating in a social context there is evidence that adolescent females
39 may mimic their parental eating behaviour, selecting and eating more of a food item if their
40 parent has just started to eat that food.

41

42 Social context has been shown to have a strong influence on eating behaviour (Herman, Roth
43 & Polivy., 2003; Goldman et al., 1991). Social modelling research has shown that the eating
44 behaviour of adults and children can be influenced by the amount of food other diners are
45 eating; eating more when others are eating more, and less when they are eating less
46 (Bevelander et al., 2012; Hermans et al., 2009). A variety of potential explanations of these
47 effects have been suggested. For example, modelling may occur because the behaviour of
48 one's peers sets a norm of what constitutes a socially appropriate amount to eat (Herman et
49 al., 2003; Vartanian et al., 2013), or because it acts as an informational cue to guide
50 behaviour (Robinson et al., 2013).

51

52 Parents are thought to be one of the most important social influences on child and adolescent
53 eating behaviour (Salvy et al., 2011), influencing health beliefs, behaviours and dietary intake
54 (Oliveria et al., 1992; Lau et al., 1990). Moreover, parental and child food consumption tend
55 to be correlated in terms of the type and amounts of food that both eat (McGowan et al.,
56 2012; Wroten et al., 2012; Sweetman et al., 2011). Likewise, research has shown that
57 children are more likely to try a food if they observe their parent eating that same food
58 (Harper et al., 1975). More recent research has also shown, in an experimental setting, that
59 the presence of a parent shapes the amount and types of food adolescents eat (Salvy et al.,
60 2011). However, the mechanisms underlying the processes by which adolescents adapt their
61 eating to match parental behaviour when eating has received less attention.

62

63 One possibility is that adolescents mimic or synchronise to their parents' eating behaviour
64 when dining together. Behavioural mimicry refers to the process whereby a person imitates
65 the behaviour of another person without conscious awareness. This is thought to occur due to
66 a tight neural link between perception and action (Chartrand & Bargh., 1999; Chartrand et al.,

67 2009), such that observing another person's movements may trigger one's own motor system
68 to perform that same movement (Lakin & Chartrand., 2003; Iacoboni., 2009), e.g. taking a
69 bite of food. Mimicry has been suggested to occur for a number of behaviours (Larsen et al,
70 2009; Neumann & Strack., 2000; Bernieri., 1988) and more recently the role of behavioural
71 mimicry in social eating contexts has been examined. Hermans et al. (2012) found that when
72 two female adults ate the same meal together, participants were more likely to pick up and eat
73 the food if their eating partner had done so in the proceeding five seconds. Similarly,
74 Bevelander et al. (2013) found that when a young child (aged 6-11) picked up and ate a
75 chocolate-covered peanut, this was associated with an increased likelihood that their eating
76 partner would subsequently pick up and eat that food. Thus, previous studies have only
77 investigated behavioural mimicry in child-only or adult-only groupings (Hermans et al.,
78 2012, Bevelander et al., 2013). Since research supports that adolescents' eating behaviour
79 may be affected by the eating behaviour of a present parent (Salvy et al., 2011), it will be
80 important to understand whether mimicry of eating behaviour may occur between a parent
81 and an adolescent. It may be the case that mimicry of parental eating is a mechanism
82 explaining parental influence on adolescent eating behaviour.

83

84 In studies to date examining behavioural mimicry during social eating, participants have only
85 been provided with a single food item to eat (Hermans et al., 2012; Bevelander et al., 2013).
86 From these studies it is, therefore, not possible to infer whether participants were mimicking
87 eating of a specific food type (if you take food x, I then take food x) or whether participants
88 were simply synchronising the rate of their food intake in a more general/non-specific
89 manner. For example, it may be that watching another person pick up a food item triggers an
90 automatic reaction to reach for any food item (non-specific food item mimicry) or only the
91 same food item (specific food item mimicry). Differentiating between these two possibilities

92 is of importance because it may signal mechanisms that underlie mimicry. If automatic
93 synchrony of gestures is of importance (Hermans et al., 2012; Iacoboni et al., 1999) then we
94 may expect to see evidence for non-specific mimicry, because mimicry of the action of eating
95 is key. Conversely, if mimicry occurs because an eating partner sets a norm about which
96 foods are and are not appropriate to eat (Vartanian et al., 2013; Herman et al., 2003), then
97 only mimicry of congruent food items may be observed. These questions are also of
98 importance because in naturalistic social eating contexts such as family meal times, a variety
99 of food items are likely to be available.

100

101 In the present study, we aimed to examine whether there is evidence that female adolescents
102 mimic the eating behaviour of their parents when eating together. In order to assess mimicry,
103 videos of parent-adolescent dyads eating a multi-item lunchtime meal were examined. We
104 examined whether there was evidence of both ‘non-specific food item mimicry’ and ‘specific
105 food item mimicry’. Based on previous studies of eating mimicry (Bevelander et al., 2013;
106 Hermans et al., 2012), it was hypothesised that a parent placing a food item in their mouth
107 would be associated with an increased likelihood that their female adolescent child would
108 also place a food item in their mouth. However, we reasoned that if evidence of mimicry was
109 observed, it may only be food item specific, as parental behaviour during a meal may
110 primarily signal which foods are appropriate to eat and when.

111

112

113 **METHOD**

114 *Background*

115 The videos analyzed were of adolescents and parents eating a multi-item lunchtime meal
116 together, which were recorded as part of a test day for a larger study examining brain

117 activations and responsiveness to food cues. In the larger study, participants arrived at the
118 laboratory on the morning of their test day where they underwent an MRI scanning session,
119 which was followed by a multi-item lunch. Participants were aware that their lunch time meal
120 would be video-recorded. However, participants were not explicitly told that their food intake
121 would be measured or that mimicry would be later examined. Three groups of participants
122 were recruited as part of the larger study: adolescents with type 2 diabetes, overweight and
123 obese adolescents (without type 2 diabetes), and healthy weight adolescents (without type 2
124 diabetes). See supplemental material for more detailed information about the selection criteria
125 for the larger study.

126

127 *Participants*

128 From the original data collected, we were unable to use ten videos due to equipment failure
129 or error. A further video was excluded because the participant did not eat anything. In
130 addition, we opted to focus on female adolescents only, due to the consistency of which
131 social influence effects have been replicated amongst females (Hermans et al., 2012; Pliner
132 and Mann., 2004; Roth et al., 2001), and there being only a small number of videos of
133 adolescent males available. Therefore, nine videos of adolescent males were not coded or
134 analyzed. Thus, the total sample for the present research consisted of 38 dyads containing
135 female adolescents eating with a parent. See Table 1 for sample ethnicity and socio-economic
136 status. There were 33 female parents and 5 male parents. The adolescents were aged 12.0 –
137 18.8 years, with a mean age of 15.4 years, $SD = 1.9$. Adolescent weight categories were
138 classified according to the defined International Obesity Task Force age specific cut offs
139 (Cole et al, 2000, Cole et al, 2007). Eleven of the adolescents were classed as being in the
140 healthy weight range (BMI 18.5-24.9), fourteen were classed as overweight and obese (BMI
141 ≥ 25) and thirteen had type 2 diabetes (BMI = 17.3-57.1). For the total sample mean

142 adolescent BMI = 30.6, SD = 9.7, and mean parental BMI = 30.1, SD = 5.8. See Table 2 for
143 adolescent and parental BMI information for the healthy weight, overweight and obese, and
144 diabetic groups separately.

145

146 For our planned analyses we did not have any hypotheses relating to whether the weight or
147 diabetes status of adolescent participants would moderate or influence any tendency to mimic
148 parental eating. This is because social influence on food intake has been shown to be a
149 relatively consistent effect and has been observed to a similar degree in both healthy weight
150 and overweight individuals (Conger et al., 1980, Herman et al., 2003, Robinson et al., 2014).
151 We did, however, check if this was the case by conducting our planned analyses (see later
152 section) and by including adolescent group (healthy weight, overweight and obese, diabetic)
153 as an additional factor. There was no evidence that adolescent group significantly moderated
154 any mimicry effects ($p > 0.05$). Thus, as the number of adolescents in each group was
155 relatively small and we did not have strong a-priori hypotheses, the results we report
156 throughout are for all adolescent participants combined.

157

158 *Lunch time meal*

159 All sessions took place in an eating laboratory at the University of Birmingham. The room
160 was furnished with a table and two chairs. Adolescents and parents were served a
161 standardized multi-item meal each on separate trays. Each lunch item was on a separate plate
162 and the meal consisted of a cheese sandwich (369 kcals), an individual Chicago Town cheese
163 pizza (453 kcal), a small bowl of cherry tomatoes (18kcal), an Activia strawberry yoghurt
164 (123 kcal), an apple (45kcal), a Satsuma (18kcal), 25g Walkers ready salted crisps (131
165 kcal), and two Maryland double chocolate cookies (112kcal). A jug of water and two glasses

166 were also provided. They were asked not to share food from each other's trays and told that
167 they were not expected to eat all the food, but to eat until they were full.

168

169

170 **ANALYSIS**

171 *Strategy of analysis for overall food consumption*

172 Our first aim was to test whether there was evidence that parent and adolescent overall food
173 intake was related. We did this by correlating the total amount of food adolescents ate (in
174 kcals) with the amount of food their parent ate (kcals) using a Spearman's correlation.

175

176 *Coding of video data*

177 To test if adolescents mimicked the eating behaviours of their parents, we coded the video
178 data by recording every time an adult or adolescent placed a food item into their mouth, the
179 name of that food item (e.g. pizza), and the time that the food entered the mouth. All
180 occurrences of eating were recorded by the first author. A random sample constituting 10%
181 of these codings were checked independently by one of the other authors and there were no
182 disagreements. The first author then coded each time an adolescent placed food into their
183 mouth during the sensitive and non-sensitive time periods of the meal (see next section
184 '*Defining sensitive and non-sensitive periods*'). All of this coding was then cross-checked by
185 an independent research assistant blind to the study hypotheses. Only a small number of
186 discrepancies were noted (7 instances of mimicry were coded incorrectly, which constituted
187 less than 1% of total coding), and these were resolved after discussion between the research
188 assistant and lead author.

189

190 *Defining sensitive and non-sensitive periods*

191 Previous studies have examined if participants are more likely to eat a food item in the 5 or
192 15 seconds after a dining partner has placed food in their mouth (known as a ‘sensitive
193 period’), compared to the other periods of the meal when a partner has not recently placed
194 food into their mouth (known as a ‘non-sensitive period’) (Hermans et al., 2012; Bevelander
195 et al., 2013; Larsen et al., 2010). In the present study we examined three sensitive timeframe
196 cut off points (+2, +5, +15 seconds), because we reasoned that mimicry may also occur in a
197 shorter time frame (i.e. within + 2 seconds of a person eating) than previous studies have
198 tested, as mimicry has been suggested to be automatic (Iacoboni et al., 1999). The three
199 timeframe cut off points (+2, +5, +15) were treated as *separate* timeframes. Each meal was
200 split into sensitive (the times during the meal in which a parent had recently placed food into
201 their mouth) and non-sensitive time periods (all other times during the meal; i.e., the times
202 during the meal in which a parent had not recently placed food in their mouth) for each of the
203 three *separate* time frames (+2, +5, +15). This approach allowed us to test whether the rate at
204 which adolescents placed food into their mouth differed between *sensitive vs. non-sensitive*
205 periods for the three time frames individually. (See ¹ for a detailed example). We presumed
206 that if adolescents ate at a quicker rate during sensitive vs. non-sensitive periods, this would
207 constitute evidence of mimicry. We calculated the rate of placing food into the mouth
208 (defined as a consumption ratio, see next section) as opposed to the number of times food
209 was placed in the mouth. We did this to account for differences in total sensitive vs. non-
210 sensitive time during each meal.

211

212 *Strategy of analysis for mimicry*

213 As noted, we coded how frequently adolescents placed food items into their mouth during the
214 sensitive periods (times when the parent **had** recently placed food in their mouth) and during
215 the non-sensitive periods (times when the parent **had not** recently placed food in their mouth)

216 of the lunchtime meal, for the three time frames separately. We then quantified this formally
217 by computing ‘consumption ratios’; the number of times a food item was placed into an
218 adolescents’ mouth per second². Following this, we compared the consumption ratio
219 observed for the sensitive periods vs. non-sensitive periods of the meal using a Wilcoxon
220 signed ranks test³ for the three different time frames individually (+2, +5, +15). We adjusted
221 the analyses using a Bonferroni correction to account for multiple comparisons. This allowed
222 us to compare the consumption ratios (the number of times a food item was placed into an
223 adolescents’ mouth per second) for the periods of the meal in which a parent had recently
224 placed into their mouth vs. periods of the meal in which the parent had not recently placed
225 food into their mouth. Importantly, we computed these consumption ratios for both *non-*
226 *specific* food item mimicry and *specific food* item mimicry.

227

228 *Non-specific food item mimicry*

229 In order to compute consumption ratios for **non-specific** food item mimicry, we used the
230 aforementioned analysis strategy and examined the rate at which adolescents placed **any** food
231 item into their mouth during the sensitive periods vs. the rate at which adolescents placed **any**
232 food into their mouth during the non-sensitive periods. This analysis allowed us to examine
233 whether adolescents more frequently placed **any** food item in their mouth in periods when
234 their parent had recently placed **any** food item in their mouth, as opposed to periods of the
235 meal when a parent had not recently placed **any** food in their mouth.

236

237 *Specific food item mimicry*

238 In order to compute consumption ratios for **specific** food item mimicry here we examined the
239 rate at which adolescents placed the **same** food item into their mouth which their parent had
240 placed in their mouth in the proceeding 2, 5, or 15 seconds (sensitive period) vs. times when

241 the parent **had not** placed a food item into their mouth in the proceeding 2, 5, or 15 seconds
242 (non-sensitive periods). This analysis allowed us to examine whether adolescents more
243 frequently placed a food item in their mouth in the periods of the meal in which their parent
244 had recently placed the **same** food item in their mouth, as opposed to all other time periods of
245 the meal.

246

247 Thus, we were able to examine whether there was evidence of *specific* food item and *non-*
248 *specific* food item mimicry using +2, +5 and +15 time frames individually.

249

250 **RESULTS**

251 *Total food intake*

252 Parents ate a mean of 816.1 (± 204.8) calories during the lunchtime meal, and adolescents ate
253 a mean of 697.6 (± 238.3) calories during the meal. A Spearman's correlation showed that the
254 amount eaten by the parents and children was significantly correlated [$r(38) = .49, p < .001$],
255 whereby a parent eating a larger number of calories was associated with their adolescent child
256 also eating a larger number of calories.

257

258 *Meal length and frequency of food being placed into the mouth*

259 Mean meal length was 18 minutes and 13 seconds ($SD = 6.37$). The mean number of times
260 that parents placed any food item into their mouth was 59.50 ($SD = 19.07$). The mean number
261 of times that adolescents placed any food item into their mouth was 77.84 ($SD = 24.19$). On
262 average, parents placed food into their mouth every 19.88 seconds ($SD = 8.98$), which
263 constitutes a mean consumption ratio = 0.06 bites per second during the meal. Adolescents
264 placed food into their mouth every 14.53 seconds ($SD = 4.93$) on average, which constitutes a
265 mean consumption ratio = 0.08 bites per second during the meal.

266

267 *Non-specific mimicry*

268 There was little evidence of non-specific food item mimicry during the meal. The
269 consumption ratios for each of the three sensitive time periods were not significantly higher
270 than the consumption ratios observed during the equivalent non-sensitive periods; +2 ($z =$
271 $.17, p = .26, r = -.03$) +5 ($z = -1.47, p = .42, r = -.24$), and +15 ($z = -2.27, p = .06, r = -.37$). (See Table
272 3 for consumption ratio values). This indicates that the rate at which adolescents placed any
273 food into their mouth (the consumption ratios) was similar during the periods of the meal in
274 which their parent had recently placed any food into their mouth (sensitive periods) and all
275 other periods of the meal in which their parent had not recently placed any food into their
276 mouth (non-sensitive periods). This effect was regardless of whether ‘sensitive’ was defined
277 as being within +2, +5 or +15 seconds after a parent had placed food into their mouth. Thus,
278 it was not the case that adolescents were significantly more likely to place any food item into
279 their mouth if their parent had recently placed a food item into their mouth.

280

281 *Specific mimicry*

282 For specific food items, there was evidence of mimicry for the +2 ($z = -3.42, p < .001, r =$
283 $-.55$), +5 ($z = -3.90, p < .001, r = -.63$), and +15 ($z = -3.73, p < .001, r = -.60$) second timeframes;
284 consumption ratios during these sensitive time periods were higher than the consumption
285 ratios observed during the equivalent non-sensitive periods. (See Table 3 for consumption
286 ratio values). This indicates that the rate at which adolescents placed a food into their mouth
287 was greater in the periods of the meal in which their parent had recently eaten that same food
288 item (sensitive periods) compared to the other remaining periods of the meal in which their
289 parent had not recently eaten that same food item (non-sensitive periods). This effect was
290 regardless of whether ‘sensitive’ was defined as being within +2, +5 or +15 seconds after a

291 parent had placed food into their mouth. Thus, there was evidence that adolescents were
292 significantly more likely to place a food item in their mouth if their parent had recently
293 placed that same food item into their mouth.

294

295

296 **DISCUSSION**

297 The present study examined whether there is evidence that female adolescents may mimic
298 their parents when eating together during a lunchtime meal. In line with previous work (Story
299 et al., 2002), there was evidence of a positive correlation between parent and adolescent food
300 consumption; adolescents consumed more calories during their lunch when their parent
301 consumed more calories. We also examined if behavioural mimicry may underlie the
302 influence that parents can have on their adolescents' eating behaviour. Results indicated that
303 a parent placing a food item into their mouth was associated with an increased likelihood that
304 their adolescent child would subsequently pick up and eat the *same* food item during the
305 following two, five and fifteen second periods. However, we did not find evidence that a
306 parent placing a food item into their mouth was associated with an increased likelihood of
307 their child placing *any* food item into their mouth in these time periods. Thus, adolescents
308 appeared to mimic eating of specific food items only.

309

310 As in previous eating behaviour studies in adults and children (Hermans et al., 2012;
311 Bevelander et al., 2013), this observational data appears to support behavioural mimicry of
312 eating. However, the current study expands on these studies because we found evidence of
313 behavioural mimicry in a different dyad than has previously been examined (adolescents and
314 parents). We were also able to test whether adolescents mimicked the *specific* type of foods
315 their parents were eating, or whether this process of mimicry was not food item specific, i.e.

316 whether the parent placing a food into their mouth would simply increase the likelihood that
317 the adolescent would place any food in their mouth. The findings of the present study suggest
318 that adolescents were not simply synchronising their gestures or eating speed to match their
319 parents (due to a lack of evidence for non-specific mimicry), which has been suggested as a
320 potential explanation for social influence on eating (Hermans et al., 2012). Instead,
321 adolescents may have been using their parents as a reference point about which food items to
322 eat and when, which could be interpreted through either a normative or informational account
323 of social influence on eating (Robinson et al., 2013; Herman et al., 2003). Further studies
324 will, however, need to address this proposition more directly. The main novel finding of the
325 present work was that we found evidence of specific food item mimicry during a shorter time
326 frame (during the same or subsequent two seconds after a parent had placed food into their
327 mouth), and within a different relationship than has been previously tested (Hermans et al.,
328 2012; Bevelander, 2013). This finding suggests that there may be evidence for mimicry of
329 eating behaviour in a shorter time frame than has been previously assumed.

330

331 One possible reason why we did not find evidence for non-specific mimicry (i.e. a parent
332 placing food into their mouth was not associated with an increased likelihood that the
333 adolescent subsequently placed *any* food into their mouth) is that the rate of adolescent eating
334 was relatively high during the meal. It could be argued that a high eating rate across all
335 periods of the meal would make it difficult to observe differences between periods of the
336 meal in which a parent had vs. had not recently eaten. This might be the result of a form of
337 ceiling effect. Thus, further research examining food-item specific vs. non-food item specific
338 mimicry in other meal settings which promote a slower pace of eating would be valuable. It is
339 also possible that the influence parents appeared to have on adolescent eating may be, in part,
340 explained by a form of visual attentional bias (Laibson, 2001; Wardle, 2007; Hardman et al.,

341 2014), such that adolescents visually followed parental gaze or hand movement to food
342 choices, and parents visually attending to a specific food increased the likelihood that the
343 adolescent then followed that cue and ate the same food.

344

345 A strength of the present study was that we examined parent-adolescent child dyads eating in
346 a semi-naturalistic environment, rather than examining behavioural mimicry when a member
347 of the dyad (i.e., the confederate) has been instructed on how much to eat (Hermans et al.,
348 2012; Bevelander et al., 2013). Moreover, we examined mimicry during a multi-item lunch
349 time meal which allowed us to examine the extent to which adolescents mimicked specific
350 food choices. It is not clear whether this finding of specific mimicry is unique to this dyad or
351 whether it may occur in other relationships, therefore, further research is needed. Due to the
352 cross-sectional nature of the present study one possibility that we cannot rule out is that some
353 of the specific mimicry we observed may have been explained by the adolescents and parents
354 already sharing similar meal/food item order preferences. Thus, further work could build on
355 the findings reported here by examining the effect of experimentally manipulating a parent's
356 behaviour during a meal on the extent to which their adolescent child mimics this behaviour.
357 One limitation that could also be addressed in further work is to investigate evidence of
358 mimicry between adolescent males and their parents. Here our sample was female. However,
359 recently Bevelander et al., (2013) found that both male and female children (6-11 years old)
360 were more likely to eat after witnessing a peer reaching for snack food than without such a
361 cue. Therefore, it is possible that adolescent males may model the eating behaviour of their
362 parents, and that mimicry may underlie this modelling. In addition, the current study focussed
363 on adolescents' mimicry of parental eating. However, a previous study found mimicry among
364 both eating companions (Hermans et al, 2012). Therefore, it may be of interest to investigate
365 whether mimicry of eating is a bi-directional process within this dyad. Finally, we did not

366 examine whether state (e.g., hunger) or trait (e.g., the quality of the relationship between the
367 parent and adolescent) factors may have moderated the likelihood of mimicry. Further work
368 designed to specifically explore the factors which may make mimicry more or less likely
369 would, therefore, be valuable.

370

371 *Conclusions*

372 This observational study suggests that when eating in a social context, there is evidence that
373 adolescent females may mimic their parental eating behaviour, selecting and eating more of a
374 food item if their parent has just started to eat that food.

375

376 **Notes**

377 ¹ Taking the +2 time frame as an example, the ‘sensitive periods’ of the meal were all
378 seconds of the meal which occurred within the same or next 2 seconds after a parent had
379 placed food into their mouth. The ‘non-sensitive’ periods of the meal were all other seconds
380 during the meal. Likewise, for the +5 time frame, the ‘sensitive periods’ of the meal were all
381 seconds of the meal which occurred within the same or next 5 seconds after a parent had
382 placed food into their mouth. The ‘non-sensitive’ periods of the meal were all other seconds
383 during the meal. Thus, for each participant the meal was split into ‘sensitive’ and ‘non
384 sensitive’ time using three different sensitive period cut-off points (+2, +5, +15 seconds).

385 ² Consumption ratios were calculated by counting the number of times that the adolescent
386 placed food into their mouth within a period and dividing this by the total amount of seconds
387 in that period.

388 ³ In the Wilcoxon signed ranks test the sensitive periods were deducted from the non-
389 sensitive periods. The negative ranks indicate the sensitive periods while the positive ranks
390 indicate the non-sensitive periods. No ties were observed in the analysis.

391

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485

486 **Table 1.** Demographic information of sample

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Demographics		Parent n = 38	Adolescent n = 38
Ethnicity	White	50%	55.3%
	Asian	39.5%	36.8%
	Black	5.3%	2.6%
	Chinese	2.6%	2.6%
	Other/ Mixed	2.6%	2.6%
Income*	<£15,000	41.7%	n/a
	£15,000-60,000	44.4%	n/a
	>£60,000	13.9%	n/a
Education level	Secondary school	21.10%	n/a
	GCSE	28.90%	n/a
	A-level/ College	26.30%	n/a
	University		
	Graduate	7.90%	n/a
	Post-graduate	15.80%	n/a

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489 *n=36 for income, information not available for 2 parents.

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496 **Table 2.** Mean BMI (SD) for healthy weight, overweight and obese, and diabetic adolescent
 497 groups

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	Healthy weight adolescents (n=11)	Overweight and obese Adolescents (n=14)	Type 2 diabetic adolescents (n=13)
Adolescent BMI	21.8 (1.7)	33.3 (6.9)	34.7 (11.6)
Parental BMI	26.1 (4.7)	32.1 (5.0)	31.3 (6.0)

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504 **Table 3.** Consumption ratios for food item specific and non-food item specific mimicry
 505 during sensitive and non-sensitive periods (n=38)
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	Food item specific mimicry		Non-food item specific mimicry	
	Sensitive	Non-sensitive	Sensitive	Non-sensitive
	+2 seconds			
Mean (SD)	0.022 (0.018)	0.016 (0.027)	0.078 (0.031)	0.080 (0.038)
Median	0.018*	0.011	0.070	0.070
	+5 seconds			
Mean (SD)	0.021 (0.017)	0.012 (0.006)	0.076 (0.029)	0.085 (0.048)
Median	0.018*	0.010	0.068	0.074
	+15 seconds			
Mean (SD)	0.021 (0.018)	0.011 (0.006)	0.075 (0.027)	0.109 (0.107)
Median	0.015*	0.009	0.069	0.071

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 508 Consumption ratios indicate the number of times per second adolescents placed a food item
 509 into their mouth within sensitive and non-sensitive periods. A higher ratio indicates a greater
 510 rate of placing food items into the mouth.
 511 *indicates a significant difference between the sensitive and non-sensitive consumption ratios
 512 at $p < 0.01$.
 513