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Modelling the enjoyment gained from vegetable dishes by a peer via Instagram is associated with vegetable intakes in young female adults

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ABSTRACT

Modelling has previously been demonstrated to encourage vegetable consumption in children, while in young adults, additional considerations may be required. This work investigated the impact of modelling vegetable consumption and modelling the enjoyment gained from vegetable consumption by a peer via a social media platform, on fruit and vegetable (FV) consumption in young female adults. One-hundred females, aged 18-25 years, were randomized to follow one of three Instagram accounts for 6 consecutive days, where a female peer modelled: No Vegetable consumption (N = 20); Vegetable consumption (N = 40), and Vegetable consumption plus Enjoyment (N = 40). Fruit and vegetable consumption was measured using food diaries, the day before following the account (at study start), during the 6 days, and the day after (at study end). Appeal of each Instagram post was also measured. Using regression analyses, higher vegetable and FV intakes at study end were associated with modelling enjoyment vs no modelling of enjoyment (smallest $\beta = .193$, $p = 0.04$), higher ratings for post appeal (smallest $\beta = .268$, $p < 0.01$), and higher vegetable and FV intakes, respectively, at study start (smallest $\beta = .338$, $p < 0.01$). Similar effects were found during the study. No associations were found between vegetable or FV intakes and modelling vegetable vs. no vegetable consumption (largest $\beta = -.084$, $p = 0.38$). These findings demonstrate a role for modelling the enjoyment gained from vegetable consumption, and value from the use of a digital socially-orientated intervention, for encouraging vegetable and FV consumption in young female adults.

1. Introduction

High intakes of fruits and vegetables (FV) are associated with reduced risk from a number of poor health outcomes [World Health Organization, 2022], such that the World Health Organization (WHO) currently recommends consumption of 400 g FV per day [WHO, 2022]. While awareness of these guidelines is high [Appleton, Krumplevska, Smith, et al., 2018; Rooney, McKinley, Appleton, et al., 2017], intakes of FV across Western countries is typically lower than recommended, with consumption levels particularly low among young adults [European Food Safety Authority, 2021; Eurostat, 2024; Lee et al., 2022; NHS England, 2018; Public Health England, 2020; United States Department of Agriculture, 2022]. Average FV consumption in UK adults is reported at 286 g FV/day [PHE, 2020], while for young adults, average intakes are reported as 236 g FV/day, with only 22% of 16-24 year olds in the UK consuming the recommended 5 FV portions/day [NHS England, 2018]. Similar patterns are also found in Europe and the United States [EFSA, 2021; Eurostat, 2024; Lee et al., 2022; USDA, 2022].

Young, or emerging, adulthood is a key life transition period, when individuals begin to live independently, establish their own identities and social networks, resulting in changes to circumstances and lifestyles, including to dietary behaviours [Bernardo et al., 2017; Poobalan et al., 2014; Winpenny, van Sluijs, White, et al., 2018]. Longitudinal analyses demonstrate clear reductions in fruit and vegetable intakes over the late adolescence and early adulthood life period [Tao, Wall, Larson, et al., 2024; Winpenny et al., 2018], with strong negative impacts specifically from leaving home [Bernardo et al., 2017; Tao et al., 2024; Winpenny et al., 2018].

Vegetable consumption, particularly, can be negatively affected by these life changes. Vegetables can be more difficult to consume than fruit as a result of their often unappealing tastes and the usual need for greater preparation and cooking [Appleton et al., 2016; Glasson et al., 2011]. Appealing tastes are well recognised as important for food consumption in this age group [e.g., Appleton, Barrie, & Samuel, 2019; Glasson et al., 2011; Poobalan et al., 2014]. The need for cooking may also be particularly important at this time of life when individuals typically transition from consuming meals that have often been prepared for them, to planning, shopping and cooking for themselves

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[Bernardo et al., 2017; Poobalan et al., 2014; Winpenny et al., 2018].

There is increasing recognition of the need for interventions to increase fruit, and particularly vegetable, consumption in this age group [Appleton et al., 2016; Poobalan et al., 2014]. Considering the increasing importance of social acceptance, social networks and the social environment at this life stage [Rivis & Sheeran, 2003; Stok et al., 2016], interventions based on social principles may be of particular value. One such intervention strategy is that of behavioural modelling – a key component of Social Cognitive Theory [Bandura, 1986], where behaviour is initiated or repeated following observation of the same behaviour in a role model, either through direct imitation, or through observing and learning the positive consequences of the behaviour [Bandura, 1986].

Simply observing the behaviours of others, or being informed of these behaviours, has been found to have effects on the eating behaviours of young adults [Rivis & Sheeran, 2003; Stok et al., 2016], with positive influences particularly for this age group [Rivis & Sheeran, 2003]. Modelling can elicit these effects [Cruwys et al., 2015; Robinson et al., 2013], although studies on modelling in young adults have tended to focus on explaining unhealthy food consumption, rather than promoting healthy intakes [Cruwys et al., 2015; Robinson et al., 2013]. Modelling, however, has been found to be effective for encouraging vegetable intakes in younger populations [Appleton et al., 2016].

Some modelling studies, furthermore, demonstrate a particular role for modelling the enjoyment gained from eating, for encouraging intakes, highlighting the value of observing and learning the positive consequences of the behaviour [Bandura, 1986]. Hendy and Raudenbush [2000] and Frazier et al. [2012] report more effective modelling in children when peer models were enthusiastic about and showed positive, compared to neutral or negative facial expressions. Rousset, Schlich, Chatonnier et al. [2008], and Barthomeuf, Rousset & Droit-Volet [2009] found similar effects in adults, and we recently demonstrated a specific role for modelling enjoyment, rather than modelling intakes, for encouraging vegetable intakes in children aged 7-10 years [Appleton, Barrie, & Samuel, 2019]. A role for modelling the enjoyment that can be gained from eating may be unsurprising given the role of enjoyment in food consumption, including in fruit and vegetable consumption [Appleton & Adams, 2023; Appleton, Dinnella, et al., 2019; Larson et al., 2012; Ramsay et al., 2017]. Considering a common dislike for vegetable tastes [Appleton et al., 2016; Glasson et al., 2011], highlighting enjoyment may be particularly valuable for encouraging vegetable intakes.

Effects of modelling by fictional peers, TV idols and otherwise unfamiliar and remote models [De Droog et al., 2014; Zeinstra et al., 2017], further, suggest that individuals do not need to know a model personally, nor be in their presence, for that model to influence behaviour. In society today, social media allows easy connection with peers, including unknown peers or role models [Kaplan & Haenlein, 2010; Kietzmann et al., 2011]. Records from 2020 estimate that around 80% of 15-25 year olds use social media on a regular basis [Statistica, 2020], and the value of role models, e.g. celebrities and social influencers, is well known in marketing fields [Joshi, Lim, Jagani, et al., 2025; Pan, Blut, Ghiassaleh, et al., 2025]. Young adults are also reported to use social media for health-related reasons [Lim, Molenaar, Brennan, et al., 2022; Klassen, Douglass, Brennan, et al., 2018], although studies so far have focussed largely on explicit health-related activities, to demonstrate use primarily for information gathering and health-related support [Lim et al., 2022; Kostygina, Tran, Binns, et al., 2020; Klassen et al., 2018].

This work aimed to investigate the effects of modelling vegetable consumption and modelling the enjoyment gained from vegetable consumption by a peer via social media, on fruit and vegetable intakes in young adults. Based on the previous literature, it was hypothesised that modelling vegetable consumption (both with and without enjoyment) would result in increased vegetable and FV intakes compared with modelling no vegetable consumption, and that modelling enjoyment would result in increased vegetable and FV intakes compared with no modelling of enjoyment.

2. Methods

Using an independent groups design, 100 young adults were randomized to follow one of three social media accounts for a period of six consecutive days, and fruit and vegetable consumption was assessed the day before, during, and the day after, the six-day period.

2.1. Participants

Participants were required to be female, aged 18-25 years, and to have an account on, be familiar with, willing and able to use the social media site Instagram for the duration of the study. Only female participants were involved in the study, following suggestions that females may be more influenced by modelling than males [Cruwys et al., 2015; Hendy & Raudenbush, 2000; Rousset et al., 2008], and that life changes from adolescence to adulthood can have stronger impacts on the eating behaviours of females compared to males [Winpenny et al., 2018]. There were no other inclusion or exclusion criteria to increase the generalizability of the research. Participants were recruited from the student population of Bournemouth University, UK, and from personal contacts, for a study investigating '*The use of social media for influencing healthy eating*', with the aim of recruiting 100 participants. This target was based on our proposed regression analyses, where we aimed to include four predictor variables in a number of regression models [Howell, 1997]. Post-hoc power analyses using G*power reveal this number of participants to be sufficient to detect an effect size of .1, for an alpha of .05, at a power of .88. The study was approved by the Research Ethics Committee of Bournemouth University, UK (ID 22862/28688/39919) prior to commencement, and was run in accordance with ethical guidelines from the British Psychological Society and the Declaration of Helsinki (1983). All participants provided written informed consent prior to their involvement.

2.2. Modelling

All modelling was undertaken by peers via social media. Three peer models were involved in the study. All peer models were female, considering suggestions that effects can be stronger for same-sex models [Frazier et al., 2012], and that female peer models can have stronger effects on both genders [Hendy & Raudenbush, 2000]. All peer models were also in the norm-referent group [Robinson et al., 2013; Stok et al., 2016]; they were students, attended the same University as the participants of the study, were of a similar ethnicity to the majority of participants, and were in a higher year of study, so may have been perceived as higher status [Cruwys et al., 2015; Lim et al., 2022; Robinson et al., 2013; Stok et al., 2016]. All participants met their peer model once in person at the start of the study, when peer models also sought to develop a friendly rapport with participants, demonstrating themselves as an appropriate and attractive peer [Cruwys et al., 2015].

Modelling was undertaken through Instagram (www.instagram.com), a social media platform designed for sharing photos and short-form videos among network users. This platform is known to be popular among 15-25 year olds in the UK [Statistica, 2020], and is reportedly used primarily for self-presentation and for gaining inspiration from role models [Lim et al., 2022].

Three accounts were created each displaying consistent modelling for six consecutive days. These accounts modelled: No Vegetable consumption (account NV); Vegetable consumption (account V), and Vegetable consumption plus Enjoyment (account VE). A single post was added to each account at 6pm on each day depicting the evening meal of the peer model using a picture of the meal and objective description. For account NV, all dishes contained no or very few vegetables and this was demonstrated in the picture and description. For account V, all dishes

contained vegetables and this was demonstrated in the picture and objective description. For account VE, all dishes contained vegetables as demonstrated in the picture and objective description, and were also accompanied by a subjective description detailing enjoyment. For the purposes of the study, enjoyment was defined as *'the pleasure that you get from something, or an instance or source of pleasure or satisfaction'* [Oxford English Dictionary, 1994], and in relation to eating was considered to stem from the food itself, e.g., from the taste and texture, from the act of eating, e.g., sensations of satiation, and from a number of related experiences, such as the act of preparation or cooking [see Bédard et al., 2020, for a review]. Enjoyment descriptions detailed a number of aspects of enjoyment, e.g., taste, visual appearance, ease of preparation, to acknowledge these multiple potential sources of enjoyment and retain realism, although descriptions were limited to the sources of enjoyment that were independent of individual circumstances, such as dining companions. Enjoyment was modelled only through the text comments; each post only included pictures of dishes and comments as appropriate, there were no pictures or videos of the peer model, or pictures or models of eating activity, nor were the study accounts linked to other Instagram accounts, including those of the peer model or any related to the foods consumed. This allowed clear comparability and distinction between the intervention accounts, aiding a more thorough investigation of the elements of interest. Comparable and familiar dishes were used in all cases. A number of different dishes were used in each condition, to avoid confounding as a result of preconceptions or popular opinions of specific dishes that may have been unknown to the researchers, and to allow for the personal preferences of the peer models and practical concerns, such as ingredient availability. All peer models undertook the modelling for at least two accounts over many weeks. Importantly, all posts, and thus all modelling, were a genuine reflection of the consumption of each peer model during the weeks they were involved in the study, with all dishes prepared and consumed by the peer models themselves for their evening meal. This aspect of the study guaranteed against deception as part of the study, but also ensured all posts were realistic and would be perceived as realistic by participants. The exact dishes used for each post and their descriptions are given in Table 1. Examples of posts are also provided in the Supplementary Materials.

Following recruitment, participants were randomized by drawing counters from a hat, to follow one of the three Instagram accounts at a ratio of 1:2:2, such that twice as many participants were randomized to follow accounts V and VE, compared to account NV. Randomization was constrained towards the end of recruitment such that of the 100 recruits, 20 participants were randomized to follow account NV, 40 to account V and 40 participants to follow account VE.

2.3. Fruit and vegetable consumption

FV consumption was assessed the day before, for each day during, and the day after, the six-day period over which the Instagram posts were shown, by means of online food diaries. Food diaries are a well-recognised methodology for capturing free-living food intakes over the short-term [Hooson, Hutchinson, Warthon-Medina et al., 2020; National Cancer Institute, 2021; Trabulsi & Schoeller, 2001], with completion aided for the study by the use of digital tools, which could be accessed by mobile phone, tablet and computer [Raatz et al., 2015; Sharp & Allman-Farinelli, 2014]. Separate diaries were completed for each day, where participants were requested to record type and amount of all fruits and vegetables consumed *'before breakfast', 'at breakfast', 'between breakfast and lunch', 'at lunch', 'between lunch and evening meal', 'at evening meal'* and *'after evening meal'*. A template with these headings and appropriate time stamps was provided to participants on the digital platform Qualtrics (www.qualtrics.com) for completion at the end of each day, with the template intended to aid recall and accurate reporting. Recording only FV consumption was intended to ease participant burden, as is recommended when several repeat diaries are required [NCI, 2021]. Training on diary completion was provided for all participants in advance of study participation. This training involved detailed tuition on the information required for accurate food recording, including the use of household portion sizes, details of common food items that can be mis-reported or easily forgotten, discussion of some example diary entries, and required participants to provide a food diary for the previous day as a practice. Practice food diaries were checked with participants on an individual basis for completeness, using recollection throughout the day, number of FV items provided, and checks for drinks, snacks and small tastes, e.g., during cooking. Considering the possibility that no FV were accurately consumed on any one day, no formal criteria for completeness were applied, and researchers, instead, sought to work with participants to demonstrate the importance of completeness and accuracy in dietary recording, and gain their support for testing the study aims. Participants were not permitted to take part in the study if researchers were concerned over the accuracy or

Table 1
Pictures, objective and subjective descriptions for all posts.

Account NV	Account V	Account VE
Picture and description	Picture and description	Picture and description as for account V, plus caption
Margherita Pizza (cheese and tomato sauce topping)	Roasted Vegetable Pizza (cheese, pepper, onions, tomatoes, olives, and tomato sauce topping)	This was incredible! The colours are very inviting, it was so delicious and nourishing!
	Homemade pizza, topped with pepper, tomatoes, sweetcorn, spinach, onion and ham.	These pizzas were incredible. The bright colours make it look very delicious and made me feel very happy.
Spaghetti carbonara with bacon and a creamy sauce	Spaghetti carbonara with bacon, onion, spinach and a side of garlic & herb bread	This dish was so appetising! It was very enjoyable, luscious and made me feel very happy!
Pasta with cheese and a sprinkling of pesto	Vegetable pasta including yellow pepper, broccoli and tomatoes.	This dish was easy to make, appetising and enjoyable
Beef burger in a brioche bun (limited garnish)	Beef burger with lettuce, tomato, red onion, gherkin and a brioche bun	This burger was quick and easy to make, delicious and so full of flavour
Chicken soup with white baguette	Vegetable soup and a bread roll	This was very tasty! The flavours were divine, overall a very pleasurable dinner!
Chilli salmon with potato wedges (minimal garnish)	Chilli salmon and potato wedges, with pepper and peas on the side.	I loved this fresh meal. It was full of flavour and the roasted vegetables on the side added a delicious flavour.
Chinese style pork with egg fried rice (limited vegetables incorporated)	Chicken stir-fry with broccoli, red pepper, onion and brown rice	Yummy! this was amazing! it was mouthwatering and had so much flavour! The colours from the veggies are so beautiful
	Paella with prawns, chorizo, onion, tomato, peas and a squeeze of lemon	Wow! This dish was so fresh and delicious! It looks so comforting and the flavours were captivating!
Homemade chicken katsu curry with rice.	Homemade chicken katsu curry with rice, includes carrots, broccoli and green beans on the side.	This was overall a very pleasurable dinner. The flavours were very tasty.
	Vegetable Pad Thai, includes peppers, broccoli, peas, onion, lemon and an egg to thicken the sauce.	This meal was very comforting. The veggies added a nice colour to the dish.

completeness of their food diaries during these individual discussions.

On completion of the study, all FV entries were converted into portions according to UK government guidelines, and added to provide separate totals for portions of vegetables consumed per day, portions of fruit and portions of FV combined. Where amount consumed was not provided or was unclear, a single portion was estimated for all single fruit items, e.g. an apple, a banana, and a half portion was estimated for all small fruits, e.g. raspberries, and all vegetables. A whole portion was estimated for a vegetable-based main meal item, e.g. a bean burger and a quarter portion was estimated for garnish or items within a food product such as a sandwich.

In addition to recording FV consumption, each daily diary entry also requested the number of dishes included in the post, and an assessment of the appealing nature of the depicted meal. Number of dishes was requested to verify that participants had viewed the intended post each day. Appeal was assessed with the question '*How appealing was today's meal*?' and a 7-point Likert response format ranging from '*very unappealing*' to '*very appealing*'. Appeal was requested to ensure participants viewed the post each day in sufficient detail to make this judgement, and allowed assessment of any effects due to individual differences in the perceived appeal of each meal viewed. Appeal ratings for all six meals in the Instagram posts were averaged to provide a mean rating for appeal for each participant for the 6 days, from 1 to 7, where higher scores denoted higher appeal.

2.4. Procedure

All participants began the study on a Wednesday, following a study briefing and training in food diary completion, randomization, and registration for the relevant Instagram account. Each day of the study, participants were then asked to view the Instagram post and complete the online food diary template in full after 6pm. Instagram posts were displayed on six consecutive days from Thursday to Tuesday and a final food diary was also completed on the following Wednesday. The use of the same day of the week for the first and last day of the study were intended to increase consistency across non-study related variables, such as everyday schedules. Only one Instagram account was run over any eight-day period, to reflect the true consumption of the researcher, and avoid contamination between conditions if friends or housemates signed up for the study. All researchers were thus fully aware of the modelling condition that each participant undertook and the order in which these were scheduled. The study was run from Bournemouth University, UK, with data collected from Nov. 2018 – Feb. 2019, Nov. 2019 – Feb. 2020, and Nov. 2021 – Feb. 2022.

2.5. Analyses

All FV portion estimations and totals were calculated at a single timepoint after all participants had completed the study, by a researcher who had had no contact with participants and for whom group allocation remained concealed while the data were processed.

Data were then analysed using descriptive statistics, and linear multiple regression analyses (enter method). Regression analyses were run where vegetable, fruit and FV consumption at study end and over the duration of the study, were predicted using variables to describe: modelling consumption; modelling enjoyment; post appeal; and vegetable, fruit and FV consumption, respectively, at study start. Consumption at study end was investigated using food diaries from Day 8; consumption over the duration of the study was investigated using mean intakes from Day 2 to Day 7, so accounting for unusual intakes on any one day. Dummy variables were used to denote modelling consumption (no = 0 (group NV)/yes = 1 (groups V and VE) and modelling enjoyment (no = 0 (groups NV and V)/yes = 1 (group VE)). Mean post appeal (1 -7) and portions of vegetables, fruit and FV consumed at study start were analysed as continuous variables. Multiple regression analyses were undertaken rather than alternative analyses, such as ANOVA, ANCOVA, or LMM, for a number of reasons. First, regression analyses allowed the simultaneous investigation of modelling vegetable consumption (groups V and VE vs NV) and modelling enjoyment (group VE vs groups NV and V) across the three groups within the data set [Howell, 1997; Torgerson & Torgerson, 2008; Vickers & Altman, 2001]. Second, additional independent effects of post appeal could also be assessed [Howell, 1997; Torgerson & Torgerson, 2008; Vickers & Altman, 2001]. Third, considering the public health nature of the work, we were interested in vegetable consumption and the impacts of the intervention elements on this, rather than the test of an intervention *per se* [Torgerson & Torgerson, 2008; Vickers & Altman, 2001]. Regression analyses allow the description of vegetable consumption, and the relative impacts on this of a number of factors of potential interest or importance. Vegetable, fruit and FV consumption at study start were included for both statistical reasons, based on room for change, and because past consumption is an important predictor of future consumption for FV [Appleton & Adams, 2023; De Bruijn, 2010; De Bruijn, Kremers, de Vet et al., 2007]. Regression analyses also allowed consideration of all predictor variables on an individual basis, rather than solely on a group basis, enhancing explanatory value [Howell, 1997; Torgerson & Torgerson, 2008; Vickers & Altman, 2001]. Primary analyses were pre-specified in advance, to allow an estimation of required sample size, as given earlier. Analyses were not publicly pre-registered.

All participants provided data at study start, and all subsequent completed diary entries confirmed viewing of each intended post, i.e., all participants reported the correct number of dishes included. Where data were missing (up to two diaries per person), data were completed with mean vegetable consumption, fruit consumption and post appeal rating for the individual based on the six or seven completed diary entries. Five participants failed to provide any data beyond the study start (1 participant allocated to view account NV, 3 participants allocated to view account V, and 1 participant allocated to view account VE). Consumption data for these individuals for study end and study duration were based on their data at study start, with data on post appeal completed with the mean of the group to allow these individuals to be included in all analyses. Analyses were primarily undertaken on an Intention-To-Treat basis, defined as the inclusion in analyses of all participants who were randomized, in the groups to which they were randomized [Torgerson & Torgerson, 2008], and these analyses are presented in the main text. Per-protocol analyses were also conducted at the request of the journal section editor. These analyses are given in the Supplementary Materials. Checks for multi-co-linearity between variables revealed no concerns in advance of all analyses. Significance was set at $p < 0.05$, assuming null hypothesis testing. Data were analysed using IBM SPSS Statistics version 28.

3. Results

3.1. Primary intention-to-treat analyses

Descriptive statistics for the whole study sample (N = 100) are given in Table 2. There were no differences between groups at study start, nor between groups in mean post appeal score (largest $F(2,99) = 1.80$, $p = 0.17$). Results of all regression analyses are given in Table 3.

All outcomes were predicted by the regression models. Throughout the study, greater vegetable and FV intakes were associated with higher vegetable and FV intakes, respectively, at study start (smallest $\beta = .436$, $p < 0.01$) and higher ratings for post appeal (smallest $\beta = .356$, $p < 0.01$). Greater FV intakes were also associated with modelling enjoyment (group VE) vs no modelling of enjoyment (groups NV and V) ($\beta = .183$, $p = 0.04$). At study end, greater vegetable and FV intakes were associated with modelling enjoyment vs no modelling of enjoyment (smallest $\beta = .193$, $p = 0.04$), higher vegetable and FV intakes, respectively, at study start (smallest $\beta = .338$, $p < 0.01$), and higher ratings for post appeal (smallest $\beta = .268$, $p < 0.01$). No associations were found for modelling vegetable consumption (groups V and VE) vs. no vegetable

Table 2
Descriptive statistics (mean (SD)) for vegetable, fruit, FV consumption, and meal appeal throughout the study for the whole sample (*n* 100).

Consumption (portions/day)	Account NV (*n* 20)	Account V (*n* 40)	Account VE (*n* 40)
Study start vegetables	1.6 (1.1)	1.8 (1.6)	1.8 (1.6)
Study start fruit	1.7 (1.1)	1.3 (.9)	1.2 (1.0)
Study start FV	3.3 (1.9)	3.0 (1.7)	3.0 (1.6)
Study duration (days 2-7) vegetables	1.3 (.7)	1.5 (.8)	1.7 (.8)
Study duration (days 2-7) fruit	1.2 (.8)	1.1 (.7)	1.3 (.8)
Study duration (days 2-7) FV	2.5 (1.3)	2.6 (1.1)	3.0 (1.1)
Study end (day 8) vegetables	1.5 (1.1)	1.2 (1.3)	1.8 (1.2)
Study end (day 8) fruit	1.1 (1.0)	1.2 (1.0)	1.3 (1.2)
Study end (day 8) FV	2.7 (1.6)	2.4 (1.7)	3.0 (1.6)
Mean Appeal score (1-7)	4.8 (.9)	5.1 (.9)	5.1 (1.1)

Table 3
Regression results for Vegetable Intake, Fruit Intake and FV Intake from Study End (Day 8) and Study Duration (Day 2-7) for all participants (*n* 100). Significant effects highlighted in bold.

	Whole Population (*n* 100)			
	Study Duration Days 2-7		Study End Day 8	
Vegetable Intake (portions/day)	R^2 = .32, adj. R^2 = .29, F (4,99) = 11.10, p < .01		R^2 = .21, adj. R^2 = .18, F (4,99) = 6.42, p < .01	
	Beta	p	Beta	P
Vegetable modelling[a] (0/1)	.033	.32	−.163	.11
Enjoyment modelling[b] (0/1)	.123	.19	**.223**	**.03**
Vegetable intake at study start (portions/day)	**.436**	**<.01**	**.338**	**<.01**
Post appeal (score 1 - 7)	**.356**	**<.01**	**.275**	**<.01**
Fruit Intake (portions/day)	R^2 = .43, adj. R^2 = .41, F (4,99) = 18.13, p < .01		R^2 = .24, adj. R^2 = .21, F (4,99) = 7.43, p < .01	
	Beta	p	Beta	P
Vegetable modelling[a] (0/1)	.022	.80	.084	.41
Enjoyment modelling[b] (0/1)	.156	.07	.046	.65
Fruit intake at study start (portions/day)	**.618**	**<.01**	**.481**	**<.01**
Post appeal (score 1 - 7)	.136	.09	.058	.53
FV Intake (portions/day)	R^2 = .41, adj. R^2 = .39, F (4,99) = 16.56, p < .01		R^2 = .30, adj. R^2 = .27, F (4,99) = 9.93, p < .01	
	Beta	P	Beta	P
Vegetable modelling[a] (0/1)	.008	.92	−.084	.38
Enjoyment modelling[b] (0/1)	**.183**	**.04**	**.193**	**.04**
FV intake at study start (portions/day)	**.488**	**<.01**	**.436**	**<.01**
Post appeal (score 1 - 7)	**.367**	**.01**	**.268**	**.01**

[a] No vegetables = 0, vegetables = 1.
[b] No enjoyment = 0, enjoyment = 1.

consumption (group NV) (largest β = −.084, p = 0.38). Fruit intakes throughout the study and at study end were only associated with fruit intakes at study start (smallest β = .481, p < 0.01).

3.2. Per-protocol analyses

Analyses of all participants who provided data following baseline (N = 95) are given in the Supplementary Materials. The findings in these analyses mirrored those in the primary Intention-To-Treat analyses, with the exception that an effect of modelling vegetable enjoyment vs no modelling of enjoyment was also found for fruit intakes during the study (β = .202, p = 0.03).

4. Discussion

Several valuable findings emerge from this study. First, viewing Instagram posts from a peer that modelled the enjoyment gained from vegetable dishes, was associated with greater vegetable and FV consumption, compared with no modelling of enjoyment. No associations were found for modelling vegetable consumption (vs. no vegetable consumption), and few effects were found in fruit consumption. Specific value from modelling enjoyment and limited value from modelling consumption has previously been demonstrated [Appleton, Barrie, & Samuel, 2019; Barthomeuf et al., 2009; Rousset et al., 2008]. This value from modelling enjoyment may arise by dispelling assumptions that vegetables don't taste pleasant [Appleton et al., 2016; Glasson et al., 2011], reminding individuals that vegetables can confer enjoyment [Robinson et al., 2011; Robinson et al., 2012], and/or by highlighting an unknown benefit to consuming vegetable dishes in the form of an enjoyable experience. Considering these alternatives, it is unfortunate that we did not measure perceived pleasantness or liking for vegetables at the study start. Regardless of the exact source of the effect, our study demonstrates clear benefit from modelling the enjoyment gained from vegetable dishes for vegetable intakes, while no effects were found from modelling consumption. These findings can both be explained using Social Cognitive Theory [Bandura, 1986]. According to this theory, behaviours can be learnt by direct copying from others, or by observing and learning the consequences of undertaking a behaviour. Direct copying is thought to apply to simple behaviours, where demonstration is important, while learning by observing consequences is thought to be more important for learning more effortful or unpleasant behaviours, where motivation may also be required [Bandura, 1986]. Arguably, for young adults consuming vegetables is a simple behaviour that does not need demonstrating. Rather, vegetable consumption may be an effortful or unpleasant behaviour, where the demonstration of positive consequences is helpful.

The positive associations in this study with post appeal further suggest greater vegetable and FV consumption in association with positive individual perceptions. These effects from post appeal were found independent of the content of the Instagram posts, i.e., whether the posts featured vegetables or not, or enjoyment or not, and in fact, analyses revealed no differences between the three groups in mean post appeal. These findings may provide a further demonstration of a positive association between enjoyment or positive perceptions and vegetable consumption, as above, or may also demonstrate a wider relationship between positive emotions and healthy food consumption. Other studies also demonstrate positive associations between enjoyment, positive affect and healthy food choice and consumption [Appleton & Adams, 2023; Robinson et al., 2011; Robinson et al., 2012; Schubert & Bode, 2023; Turnwald, Bertoldo, Perry, et al., 2019; Wen & Miao, 2022]. These findings on top of those by group also demonstrate the importance of individual differences in intervention success. Wide variation in liking for vegetables has previously been reported [Appleton et al., 2016; Glasson et al., 2011], and these findings serve to remind us that regardless of the intervention implemented, different interventions may be more appropriate or more effective for some individuals compared to others.

Effect sizes were small, and in fact vegetable consumption appeared to drop for those following accounts NV and V, rather than increase in those following account VE. These findings may demonstrate a genuine reduction in background consumption in all groups over the study period, as a result of changes in intake over the average week, or as a result of high interest in healthy eating or high social desirability from participants at the start of a study on '*healthy eating*', which dissipated over the course of the study [Deci & Ryan, 1985; Deci & Ryan, 2000], or they may reflect a reduction in dietary reporting as a result of the time in

the study, an effect that is well recognised when using diet diaries [NCI, 2021]. While we can not distinguish between these possibilities, and the study may have been affected by all of these to some degree, there is no reason to suggest that any of these effects would have differed by intervention group. Thus, these observations in absolute intakes do not negate the potential benefits of modelling enjoyment, relative to no modelling of enjoyment, for vegetable and FV intakes. The small size of our effects however remains, and knowledge of the aspects of the intervention that could increase effect sizes would clearly be of value. Enhanced effects can be suggested dependent on the status of the model [Bandura, 1986; Cruwys et al., 2015; Robinson et al., 2013; Stok et al., 2016], and indeed social marketing relies on the popularity of celebrities and audience respect for and trust in role models [Joshi et al., 2025; Klassen et al., 2018; Kostygina et al., 2020; Lim et al., 2022; Pan et al., 2025]. Identity with the model may also be important [Hawkins et al., 2024; König et al., 2017]. Increasing the number of models, and relevance of the modelling through providing feedback from other peers, e.g., by allowing interactions via the 'like' and 'comments' functions of the social media site, may also enhance effects [Sherman, Payton, Hernandez, et al., 2016], as may extending the intervention over time, increasing the number or variety in the dishes, or the number or variety of positive elements to the social media posts. Providing additional features, such as recipes or nutrition-based comments [Chambers, Johns, Ramirez Sierra et al., 2023; Metcalfe, Prescott, Schumacher, et al., 2022; Tobey, Schrumpf, Johnson, et al., 2017], may also add benefit, but testing here would be required; this would essentially result in a different intervention.

Few effects were found in fruit consumption, thus effects in vegetable consumption were mirrored in FV consumption. These findings suggest that increased vegetable consumption did not displace or negatively impact fruit consumption. Whether the vegetables added to the overall healthfulness of the diet, however, can not be ascertained as only FV consumption were reported throughout the study. Diaries were completed like this to reduce participant burden [NCI, 2021], but it would be interesting to ask participants to make complete dietary records to assess the true impact of the vegetable posts on whole diets. While the majority of studies aiming to increase vegetable intakes report successes for vegetables [Appleton et al., 2016], some studies do report negative impacts of this increased consumption on other aspects of the diet [Casperson, Duke, Nelson, et al., 2022]. A small effect of modelling enjoyment was found in fruit consumption in the per-protocol analyses when assessed during the study. This effect most plausibly demonstrates the strength of the effects of enjoyment or positive affect, resulting in generalization from vegetables to behaviours towards a related food group [Bandura, 1986].

In addition to the novel findings from this study, we also demonstrate low vegetable consumption in young adults - values of 1-2 portions a day, as is reported in population surveys [EFSA, 2021; PHE, 2020], and strong positive associations between past and present fruit, vegetable and FV consumption. Associations between past and present fruit, vegetable and FV consumption are commonly reported [Appleton & Adams, 2023; De Bruijn, 2010; De Bruijn et al., 2007].

Our study is limited by various design features as already mentioned – the duration of the study, the reporting of only fruits and vegetables in our food diaries, and our failure to include a measure of liking for vegetables at study start. Our study also involved only female peer models and female participants; thus we can only draw conclusions on this specific scenario. Some assessment of perceptions of the peer models would have aided understanding; effects of modelling may vary through a range of perceptions of the model [Cruwys et al., 2015; Lim et al., 2022; Robinson et al., 2013; Stok et al., 2016], although importantly in this study all models undertook at least two modelling scenarios, thus specific model characteristics are unlikely to explain our effects. Our study was also undertaken with participants of a specific age range, from a University setting, thus the results may be specific to this population. Differing effects may be found in different age groups [Appleton et al., 2016]. A University population will also be more educated and may be of a higher socio-economic status that the average young adult population. Both factors are known to be associated with FV consumption [Braune et al., 2025; Poobalan et al., 2014; Tao et al., 2024], but we have no reason to believe that the value of modelling or enjoyment may be specific to this population group. Investigation of the use of different peer models and participants, however, would be of interest [Cruwys et al., 2015; Robinson et al., 2013; Stok et al., 2016]. More detailed assessment of the individual posts, e.g., the specific dishes or presentation may also aid understanding for future benefit.

Use of the intervention and assessment of effects over a longer time frame would be of interest. From a theoretical perspective, Social Cognitive Theory suggests that modelling the positive consequences of a behaviour are important for learning effortful or unpleasant behaviours both by encouraging learning and by increasing motivation [Bandura, 1986]. Based on theories of motivation, increased enjoyment will result in greater intrinsic motivation, i.e., greater motivation to undertake the behaviour for it's own sake [Deci & Ryan, 1985; Deci & Ryan, 2000]. This intrinsic motivation would likely lead to more sustained behaviour over the longer term, and importantly could lead to sustained behaviour once modelling stops [Bandura, 1986]. Confirmation of this would be needed, but ongoing effects of an intervention once the intervention ends would clearly be of value for public health.

Further study of the aspects of the modelling that enhance its effects and the effects of the intervention on the whole diet, would clearly add value to this work in a practical sense. Based on the current study, we can suggest benefit from peer modelling for healthier diets in young adults, provided enjoyment is also involved, and modelling interventions may be appropriate for college or university settings, or in clubs, societies or institutions, where peers are already employed for roles requiring fellow engagement, e.g., as 'representatives' or 'champions'. We can offer no comment, however, on the value of this type of intervention for young adults compared with other interventions. Interventions based on education, food literacy and food-based skills are often suggested for this age-group [Klassen et al., 2018], with interventions using digital platforms and social elements highlighted [Hawkins et al., 2024; Klassen et al., 2018; Kostygina et al., 2020; Lim et al., 2022], although some individuals will be more or less influenced by their social environment than others for a variety of reasons [Hawkins et al., 2024; Cruwys et al., 2015; Klassen et al., 2018; Kostygina et al., 2020; Robinson et al., 2013; Stok et al., 2016]. There may be some merit furthermore, to a specific focus on young adulthood as an opportunity for change. The "habit discontinuity hypothesis" suggests that behaviour change may be more likely when a context change disrupts an individual's pre-existing habits, and the transition from living at home to living independently, or from being a student to working, may offer such changes in context [Winpenny et al., 2018].

In conclusion, modelling the enjoyment gained from vegetable dishes by a peer via Instagram posts compared with no modelling of enjoyment was associated with greater vegetable and FV intakes, while modelling vegetable consumption compared with no vegetable consumption had no effects. Positive associations with post appeal were also found. Our findings demonstrate value from highlighting enjoyment in a digital socially-orientated intervention for encouraging healthy eating in young female adults.

Ethical statement

The study was approved by the Research Ethics Committee of Bournemouth University, UK (ID 22862/28688/39919) prior to commencement, and was run in accordance with ethical guidelines from the British Psychological Society and the Declaration of Helsinki (1983). All participants provided written informed consent prior to their involvement.

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Declaration of competing interest

For work on understanding and encouraging fruit and vegetable intakes I have no conflicts of interest to declare.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appet.2026.108501.

Data availability

Data are available from the corresponding author on request, and will be deposited in Bournemouth University's Online Research Data Repository (BORDaR) on acceptance of the article.

References

Appleton, K. M., & Adams, C. (2023). A role for enjoyment for encouraging fruit consumption. *Appetite, 187*, Article 106609. https://doi.org/10.1016/j.appet.2023.106609

Appleton, K. M., Barrie, E., & Samuel, T. J. (2019). Modelling positive consequences: Increased vegetable intakes following modelled enjoyment versus modelled intake. *Appetite, 140*, 76–81. https://doi.org/10.1016/j.appet.2019.05.003

Appleton, K. M., Hemingway, A., Saulais, L., Dinnella, C., Monteleone, E., Depazay, L., Morizet, D., Perez-Cueto, F. J. A., Bevan, A., & Hartwell, H. (2016). Increasing vegetable intakes: Rationale and systematic review of published interventions. *European Journal of Nutrition, 55*, 869–896. https://doi.org/10.1007/s00394-015-1130-8

Appleton, K. M., Krumplevska, K., Smith, E., Rooney, C., McKinley, M. C., & Woodside, J. V. (2018). Low fruit and vegetable consumption is associated with low knowledge of the details of the 5-a-day fruit and vegetable message in the UK: Findings from two cross-sectional questionnaire studies. *Journal of Human Nutrition and Dietetics, 31*, 121–130. https://doi.org/10.1111/jhn.12487

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, New Jersey: Prentice-Hall Inc.

Barthomeuf, L., Rousset, S., & Droit-Volet, S. (2009). Emotion and food. Do the emotions expressed on other people's faces affect the desire to eat liked and disliked food products? *Appetite, 52*, 27–33. https://doi.org/10.1016/j.appet.2008.07.002

Bédard, A., Lamarche, P.-O., Grégoire, L.-M., Trudel-Guy, C., Provencher, V., Desroches, S., & Lemieux, S. (2020). Can eating pleasure be a lever for healthy eating? A systematic scoping review of eating pleasure and its links with dietary behaviors and health. *PLoS One, 15*(12), Article e0244292. https://doi.org/10.1371/journal.pone.0244292

Bernardo, G. L., Jomori, M. M., Fernandes, A. C., & Proença, R. P. da C. (2017). Food intake of university students. *Revista de Nutrição, 30*, 847–865. https://doi.org/10.1590/1678-98652017000600016

Braune, T., Livingstone, K. M., Adams, J., & Winpenny, E. M. (2025). Development of inequalities in fruit and vegetable intake through early adulthood: Insights from household panel surveys in the United Kingdom and Australia. *European Journal of Clinical Nutrition, 79*, 793–801. https://doi.org/10.1038/s41430-025-01609-x

Casperson, S. L., Duke, S. E., Nelson, A., Appleton, K. M., Larson, K., Jahns, L., & Roemmich, J. N. (2022). Incorporating Dietary Guidelines for Americans vegetable recommendations into the diet alters dietary intake patterns and improves diet quality in adults with overweight and obesity. *Journal of the Academy of Nutrition and Dietetics, 122*, 1345–1354.e1. https://doi.org/10.1016/j.jand.2022.03.008

Chambers, K.-A., Johns, T., Ramirez Sierra, I., Mitchell, A., House, L., Mathews, A., & Shelnutt, K. (2023). Evaluate the impact of a healthy meal kit intervention on food security and fruit and vegetable intake at post and Follow-up. *Journal of Nutrition Education and Behavior, 55*(suppl), 17–18. https://doi.org/10.1016/j.jneb.2023.05.041

Cruwys, T., Bevelander, K. E., & Hermans, R. C. J. (2015). Social modelling of eating: A review of when and why social influence affects food intake and choice. *Appetite, 86*, 3–18. https://doi.org/10.1016/j.appet.2014.08.035

De Bruijn, G.-J. (2010). Understanding college students' fruit consumption: Integrating habit strength in the theory of planned behaviour. *Appetite, 54*, 16–22. https://doi.org/10.1016/j.appet.2009.08.007

De Bruijn, G.-J., Kremers, S. P. J., de Vet, E., de Nooijer, J., van Mechelen, W., & Brug, J. (2007). Does habit strength moderate the intention-behaviour relationship in the theory of planned behaviour? The case of fruit consumption. *Psychology and Health, 22*, 899–916. https://doi.org/10.1080/14768320601176113

De Droog, S. M., Buijzen, M., & Valkenburg, P. M. (2014). Enhancing children's vegetable consumption using vegetable-promoting picture books. The impact of interactive shared reading and character-product congruence. *Appetite, 73*, 73–80. https://doi.org/10.1016/j.appet.2013.10.018

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum Press.

Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268. https://doi.org/10.1207/S15327965PLI1104_01

European Food Safety Authority (EFSA). (2021). Food Consumption Data 2021. Website: https://www.efsa.europa.eu/en/data-report/food-consumption-data. (Accessed 20 June 2025).

Eurostat. (2024). Health: Information on data. Available at: https://ec.europa.eu/eurostat/web/health/information-data. (Accessed 20 June 2025).

Frazier, B. N., Gelman, S. A., Kaciroti, N., Russell, J. W., & Lumeng, J. C. (2012). I'll have what she's having: The impact of model characteristics on children's food choices. *Developmental Science, 15*, 87–98. https://doi.org/10.1111/j.1467-7687.2011.01106.x

Glasson, C., Chapman, K., & James, E. (2011). Fruit and vegetables should be targeted separately in health promotion programmes: Differences in consumption levels, barriers, knowledge and stages of readiness for change. *Public Health Nutrition, 14*, 694–701. https://doi.org/10.1017/S1368980010001643

Hawkins, L., Farrow, C., Clayton, M., & Thomas, J. M. (2024). Can social media be used to increase fruit and vegetable consumption? A pilot intervention study. *Digital Health, 10*. https://doi.org/10.1177/20552076241241262

Hendy, H. M., & Raudenbush, B. (2000). Effectiveness of teacher modelling to encourage food acceptance in preschool children. *Appetite, 34*, 61–76. https://doi.org/10.1006/appe.1999.0286

Hooson, J., Hutchinson, J., Warthon-Medina, M., et al. (2020). A systematic review of reviews identifying UK validated dietary assessment tools for inclusion on an interactive guided website for researchers: Www.nutritools.org. *Critical Reviews in Food Science and Nutrition, 60*, 1265. https://doi.org/10.1080/10408398.2019.1566207

Howell, D. C. (1997). *Statistical methods for psychology* (4th ed.). London, UK: Duxbury Press.

Joshi, Y., Lim, W. M., Jagani, K., et al. (2025). Social media influencer marketing: Foundations, trends, and ways forward. *Electronic Commerce Research, 25*, 1199–1253. https://doi.org/10.1007/s10660-023-09719-z

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! the challenges and opportunities of Social Media. *Business Horizons, 53*, 59–68. https://doi.org/10.1016/j.bushor.2009.09.003

Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! understanding the functional building blocks of social media. *Business Horizons, 54*, 241–251. https://doi.org/10.1016/j.bushor.2011.01.005

Klassen, K. M., Douglass, C. H., Brennan, L., Truby, H., & Lim, M. S. (2018). Social media use for nutrition outcomes in young adults: A mixed-methods systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 15*, 70. https://doi.org/10.1186/s12966-018-0696-y

König, L. M., Giese, H., Stok, F. M., & Renner, B. (2017). The social image of food: Associations between popularity and eating behavior. *Appetite, 114*, 248–258. https://doi.org/10.1016/j.appet.2017.03.039

Kostygina, G., Tran, H., Binns, S., Szczypka, G., Emery, S., Vallone, D., & Hair, E. (2020). Boosting health campaign reach and engagement through use of social media influencers and memes. *Social Media + Society, 6*, Article 205630512091247. https://doi.org/10.1177/2056305120912475

Larson, N., Laska, M. N., Story, M., & Neumark-Sztainer, D. (2012). Predictors of fruit and vegetable intake in young adulthood. *Journal of the Academy of Nutrition and Dietetics, 112*, 1216–1222. https://doi.org/10.1016/j.jand.2012.03.035

Lee, S. H., Moore, L. V., Park, S., Harris, D. M., & Blanck, H. M. (2022). Adults meeting fruit and vegetable intake recommendations - United States, 2019. *MMWR Morb Mortal Wkly Rep, 71*, 1–9. https://doi.org/10.15585/mmwr.mm7101a1

Lim, M. S. C., Molenaar, A., Brennan, L., Reid, M., & McCaffrey, T. (2022). Young adults' use of different social media platforms for health information: Insights from web-based conversations. *Journal of Medical Internet Research, 24*, Article e23656. https://doi.org/10.2196/23656

Metcalfe, J. J., Prescott, M. P., Schumacher, M., Kownacki, C., & McCaffrey, J. (2022). Community-based culinary and nutrition education intervention promotes fruit and vegetable consumption. *Public Health Nutrition, 25*, 437–449. https://doi.org/10.1017/S1368980021003797

National Cancer Institute (NCI). (2021). Learn more about usual dietary intake. Dietary assessment primer. Available at: https://dietassessmentprimer.cancer.gov/learn/usual.html. (Accessed 20 June 2025).

NHS England. (2018). NHS Digital: Health Survey for England. Available at: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2018/health-survey-for-england-2018-data-tables. (Accessed 20 June 2025).

Oxford English dictionary. (1994). Oxford, UK: Oxford University Press.

Pan, M., Blut, M., Ghiassaleh, A., et al. (2025). Influencer marketing effectiveness: A meta-analytic review. *Journal of the Academy of Marketing Science, 53*, 52–78. https://doi.org/10.1007/s11747-024-01052-7

Poobalan, A. S., Aucott, L. S., Clarke, A., & Smith, W. C. S. (2014). Diet behaviour among young people in transition to adulthood (18–25 year olds): A mixed method study. *Health Psychol. Behav. Med., 2*, 909–928. https://doi.org/10.1080/21642850.2014.931232

Public Health England (PHE). (2020). National Diet and Nutrition Survey Rolling programme Years 9 to 11 (2016/2017 to 2018/2019). Website: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943114/NDNS_UK_Y9-11_report.pdf. (Accessed 20 June 2025).

Raatz, S. K., Scheett, A. J., Johnson, L. K., & Jahns, L. (2015). Validity of electronic diet recording nutrient estimates compared to dietitian analysis of diet records: Randomized controlled trial. *J. Med. Int. Re.s, 17*, e21. https://doi.org/10.2196/jmir.3744

Ramsay, S. A., Rudley, M., Tonnemaker, L. E., & Price, W. J. (2017). A comparison of college students' reported fruit and vegetable liking and intake from childhood to adulthood. *Journal of the American College of Nutrition, 36*, 28–37. https://doi.org/10.1080/07315724.2016.1169233

Rivis, A., & Sheeran, P. (2003). Descriptive norms as an additional predictor in the theory of planned behaviour: A meta-analysis. *Current Psychology, 22*, 218–233. https://doi.org/10.1007/s12144-003-1018-2

Robinson, E., Blissett, J., & Higgs, S. (2011). Recall of vegetable eating affects future predicted enjoyment and choice of vegetables in British University undergraduate students. *Journal of the American Dietetic Association, 111*, 1543–1548. https://doi.org/10.1016/j.jada.2011.07.012

Robinson, E., Blissett, J., & Higgs, S. (2012). Changing memory of food enjoyment to increase food liking, choice and intake. *The British Journal of Nutrition, 108*, 1505–1510. https://doi.org/10.1017/S0007114511007021

Robinson, E., Blissett, J., & Higgs, S. (2013). Social influences on eating: Implications for nutritional interventions. *Nutrition Research Reviews, 26*, 166–176. https://doi.org/10.1017/S0954422413000127

Rooney, C., McKinley, M. C., Appleton, K. M., Young, I. S., McGrath, A. J., Draffin, C. R., Hamill, L. L., & Woodside, J. V. (2017). How much is '5-a-day'?: A qualitative investigation into consumer understanding of fruit and vegetable intake guidelines. *Journal of Human Nutrition and Dietetics, 30*, 105–113. https://doi.org/10.1111/jhn.12393

Rousset, S., Schlich, P., Chatonnier, A., Barthomeuf, L., & Droit-Volet, S. (2008). Is the desire to eat familiar and unfamiliar meat products influenced by the emotions expressed on eaters' faces? *Appetite, 50*, 110–119. https://doi.org/10.1016/j.appet.2007.06.005

Schubert, E., & Bode, S. (2023). Positive emotions and their upregulation increase willingness to consume healthy foods. *Appetite, 181*, Article 106420. https://doi.org/10.1016/j.appet.2022.106420

Sharp, D. B., & Allman-Farinelli, M. (2014). Feasibility and validity of mobile phones to assess dietary intake. *Nutrition, 30*(11-12), 1257–1266. https://doi.org/10.1016/j.nut.2014.02.020

Sherman, L. E., Payton, A. A., Hernandez, L. M., Greenfield, P. M., & Dapretto, M. (2016). The power of the like in adolescence: Effects of peer influence on neural and behavioral responses to social media. *Psychological Science, 27*, 1027–1035. https://doi.org/10.1177/0956797616645673

Statistica. (2020). Reach of leading social networking sites used by those aged 15 to 25 in the United Kingdom (UK) as of 3rd quarter 2020. Available at: https://www.statista.com, 10.04.25.

Stok, F. M., de Vet, E., de Ridder, D. T. D., & de Wit, J. B. F. (2016). The potential of peer social norms to shape food intake in adolescents and young adults: A systematic review of effects and moderators. *Health Psychology Review, 10*, 326–340. https://doi.org/10.1080/17437199.2016.1155161

Tao, Y., Wall, M., Larson, N., Neumark-Sztainer, D., & Winpenny, E. M. (2024). Changes in diet quality across life transitions from adolescence to early adulthood: A latent growth analysis. *The American Journal of Clinical Nutrition, 120*(5), 1215–1224. https://doi.org/10.1016/j.ajcnut.2024.08.017

Tobey, L. N., Schrumpf, E., Johnson, T., Mouzong, C., Veith, R. M., Braverman, M. T., Wong, S. S., & Manore, M. M. (2017). Can healthy recipes change eating behaviors? The food hero social marketing campaign recipe Project experience and evaluation. *Journal of Nutrition Education and Behavior, 49*, 79–82.e1. https://doi.org/10.1016/j.jneb.2016.09.001

Torgerson, D. J., & Torgerson, C. J. (2008). *Designing randomised clinical trials in the health, education and social sciences: An introduction*. Basingstoke, UK: Palgrave Macmillan.

Trabulsi, J., & Schoeller, D. A. (2001). Evaluation of dietary assessment instruments against doubly labeled water, a biomarker of habitual energy intake. *American Journal of Physiology. Endocrinology and Metabolism, 281*, E891–E899. https://doi.org/10.1152/ajpendo.2001.281.5.E891

Turnwald, B. P., Bertoldo, J. D., Perry, M. A., Policastro, P., Timmons, M., Bosso, C., et al. (2019). Increasing vegetable intake by emphasizing tasty and enjoyable attributes: A randomized controlled multisite intervention for taste-focused labeling. *Psychological Science, 30*, 1603–1615. https://doi.org/10.1177/0956797619872191

United States Department of Agriculture (USDA). (2022). Food consumption and nutrition estimates 2015-2018. Website https://www.ers.usda.gov/data-products/food-consumption-and-nutrient-intakes/food-consumption-and-nutrient-intakes/#Food%20Consumption%20Estimates Accessed 22.06.22.

Vickers, A. J., & Altman, D. G. (2001). Analysing controlled trials with baseline and follow up measurements. *BMJ, 323*(7321), 1123–1124.

Wen, J., & Miao, M. (2022). Relationships between meaning in life, positive and negative affect, and eating behaviors: A daily diary study. *Journal of Happiness Studies, 23*, 1315–1331. https://doi.org/10.1007/s10902-021-00450-w

Winpenny, E. M., van Sluijs, E. M. F., White, M., Klepp, K.-I., Wold, B., & Lien, N. (2018). Changes in diet through adolescence and early adulthood: Longitudinal trajectories and association with key life transitions. *International Journal of Behavioral Nutrition and Physical Activity, 15*, 86. https://doi.org/10.1186/s12966-018-0719-8

World Health Organization. (2022). *Healthy diet. Website* Accessed 22.04.25 https://www.who.int/news-room/fact-sheets/detail/healthy-diet.

Zeinstra, G. G., Kooijman, V., & Kremer, S. (2017). My idol eats carrots, so do I? The delayed effect of a classroom-based intervention on 4–6-year-old children's intake of a familiar vegetable. *Food Quality and Preference, 62*, 352–359. https://doi.org/10.1016/j.foodqual.2016.11.007