What makes you *fupy* ('food' + 'happy')? Leveraging strategic maneuvering to build food coaching apps

Elena Musi[1], Rudi Palmieri[1], Chiara Mercuri[2], Alessandro Giudici[3], Neil Maiden[3], Charlotte Hardman[4] and Rita Borgo[5]

[1]*University of Liverpool, Department of Communication and Media, School of the Arts, 19 Abercromby Square, Liverpool, L69 7ZG United Kingdom*
[2]*USI Università della Svizzera italiana, Institute of Argumentation, Linguistics and Semiotics, Via Buffi 13, 6900 Lugano, Switzerland*
[3]*Cass Business School, Faculty of Management 106 Bunhill Row, London, EC1Y 8TZ, United Kingdom*
[4]*University of Liverpool, Institute of Population Health, Waterhouse Building, Block B, Brownlow Street, Liverpool, L69 3GF United Kingdom*
[5]*King's College London, Human Centred Computing Group, Bush House, 30 Aldwych, London, WC2B 4BG United Kingdom*

Abstract

Recommendation systems (RS) play a crucial role in influencing our daily decision-making practices and choices, such as healthy diets. However, arguments in support of a diet recommendation, which are embedded in the algorithmic design of the RS, tend to be redundant, and predominantly based on the past choices of the users or their peers, thus hindering rather than encouraging innovation and creativity. Such arguments are, thus, not effective when changes in users' habits are the goal, as in digital food coaching. To better inform the design of RS, we propose to conceive of human-computer interaction with RS as a *strategic maneuvering*, that is an argumentative exchange aimed at improving users' critical decision-making process while persuading them to keep up a healthy diet. Strategic maneuvering is accomplished at three levels: selection from the topical potential, adaptation to audience demand and display of presentational devices. Based on the results of a study including a quantitative questionnaire to and a focus groups with Italian mothers living in the UK (35-45 years old), we show how audience demand (perceived food qualities) and presentational devices (naming of recipe categories) can be exploited when selecting what recipes (topical potential) to recommend in order to trigger creativity and help users achieve a healthier diet.

Keywords

[1] Proceedings Name, Month XX–XX, YYYY, City, Country

Recommendation systems, strategic maneuvering, digital food coaching, creative triggers

1. Introduction

In the field of Computer Science and Information Systems, Recommendation systems are conceived of as a set of algorithms that propose a ranked list of items according to the presumed relevance to individual users [6]. That of recommendation, regardless of the interface that conveys it (e.g. chatbot, advertisement), is a speech act which is predisposed to be argumentative since aimed at convincing one party to undertake a course of action (e.g. "you should buy/listen to X"). The recommendation constitutes, in fact, a standpoint supported by arguments that are left opaque to the users, but are structurally built in the algorithms design, which is content-based and/or based on collaborative filtering. The former [15] relies on the assumption that since users' preferences persist through time, a user's model of previously rated items can be used as a predictor for preferences over new items ("you shall buy *x* since you always bought products very similar to x"). The latter, based on the assumption that users' preferences are correlated [12], leverages on ratings of users which are like the current user ("you shall buy *x* since people similar to you buy products very similar to *x*"). In argumentative terms, both techniques are based on inductive and analogical argument schemes.

Despite worrisome ethical concerns that might arise from such recommender systems [19], they proved to be effective in commercial environments where the intended perlocutionary effect of the recommendation is that of making the user buy/consume a certain product. A different situation is when the issue at stake is not consumption, but a habit change towards, for instance, a healthier diet. In such e-Health environments [14], healthier versions of food choices modeled on the users' past choices and/or his/her peers according to social network activities do not constitute good arguments to change diet, as they foster redundancy rather than innovation. This is especially the case in the nutrition domain, where redundancy undermines motivation [3], leading to diets drops out. With the goal of informing their design, we propose to devise the interaction with food coaching recommendation systems as a case of *strategic maneuvering* [8], which happens when arguers try to strategically combine their dialectical goals (critical discussion) and rhetorical goals (effectiveness). The recommendation system can be understood as an arguer that engages itself in a critical discussion with the users to help them shape their nutritional decision-making processes and achieve the goal of changing/improving food consumption habits. In such a scenario, the recommendation system is not conceived as tracking a pre-established user identity, but as a tool that helps the users re-construct their nutrition identity dynamically [13]. While preliminary approaches to argument-based recommender systems able to provide the users with explanations beyond a recommendation have been proposed, a reconceptualization of RS as argumentative critical discussions is missing [5].

Drawing from recent studies in human-computer interaction ([16], [20]), we take as common ground the idea that triggering curiosity for 'new' foods and recipes increases creativity, which bears an argumentative role in persuading users to keep up with their diets, being self-rewarding. To design effective recommendation systems which stimulate curiosity, we propose to draw upon the three main components of strategic maneuvering: topical potential, audience demand, and presentational devices (section 2). As a case study, we focus on the recommendation system for recipes embedded in the food coaching app *Libraway* (https://libraway.com/): how to recommend recipes which boost users' curiosity and creativity? How do users perceive human vs. digital recommendations? What aspects of recipe categories facilitate curiosity and creativity? To answer these questions, we report and discuss the results of a quantitative questionnaire targeting Italian mothers living in the UK and

EMAIL: elena.musi@liverpool.ac.uk (A. 1); rudi.palmieri@liverpool.ac.uk (A. 2); chiara.mercuri@usi.ch (A. 3); Alessandro.Giudici.2@city.ac.uk (A. 4); Neil.Maiden.1@city.ac.uk (A. 5); cah@liverpool.ac.uk (A. 6); rita.borgo@kcl.ac.uk (A. 7)

we comment on the attested trends in focus groups. Finally, we show how the results can be used to inform the design of food coaching apps based on recommendation systems such as Libraway as a digital creative support fostering healthy diets.

2. Theoretical Framework

In line with [3], we define creative triggers as "qualities – non-functional requirements – that people associate with innovative solutions". In our case, the innovative solution at stake is a food coaching recommender system that allows users to follow a diet while discovering new recipes that make them feel satisfied with their nutrition. We refer to this this type of satisfaction as 'fupyness', to account for its emotional aspects of the visceral and reflective types [7]: certain types of food (e.g. chocolate) are difficult to avoid since they provoke an immediate, prewired pleasure. However, even if we are happy when we eat them at first, they then might cause negative reflective emotions once we feel intoxicated for having had too much or guilty for having eaten something unhealthy [18]. The strategic goal of the interaction with the recommender system is triggering users' creativity to foster a healthy diet. To effectively achieve this goal, the RS has to accomplish a strategic maneuvering at the level of topical potential [8], namely the selection of arguments (recipes in our case) from those available that are most advantageous in achieving the aims. In this regard it is crucial to consider the audience demand, namely how to frame the arguments "in such a way that they are expected to be optimally acceptable to the other party in view of that party's views and preferences" [10]. Assuming that users want to be fupy, they will be more easily persuaded in trying new healthy recipes if adhering with those features that make them feel fupy. Thus, we run a preliminary investigation about what are the perceived qualities for fupyness and their meaning (e.g., what does light actually mean?). We plan to directly gather such information from users' through dialogical interaction with the food coaching app. In this way, we will gather clues on how to counter informational barriers [1] to behavioral change (e.g. is fupyness associated to actual nutrional values?).

However, not every user might be inclined to trust a digital app as a digital creative support. To achieve a human-centered design, another aspect of the topical potential has to be considered, namely what types of recommendations would be deemed trustworthy from a digital rather than human support. Finally, to work as creative triggers the proposed categories of recipes call for presentational devices that make them catchy.

3. Data and Methods

3.1. Quantitative questionnaire

We have designed a questionnaire (see Appendix) containing 36 questions aimed at gathering (i) demographic infos; (ii) general nutritional and digital everyday habits; (iii) opinions targeting nutritional behaviors (food qualities and decision making processes); (iv) opinions targeting digital behaviors (use of recommendation systems). To answer our research questions about creative triggers we focus in this study on (iii) and (iv). We targeted Italian mothers living in the UK within the 35-45 years old age range for two main reasons. First, mothers in that age range tend to be nutritional gatekeepers for their children, influencing their food intake as well as their food education; their decision making choices have, however, to account for a variety of factors such as time and economic restrictions which challenge creativity. Second, they constitute the privileged users of the startup Libraway. The questionnaire has been hosted on the platform Qualtrics and remained accessible for one month (August 2020). The questionnaire has been advertised through a set of social media groups (e.g., Facebook group "Italian mothers in the UK") and emailing lists

from cultural institutions (e.g., the Italian school “Mamma mia”) addressing the target group.

We have obtained 568 responses overall. Particular attention has been devoted to designing questions of type (iii) and (iv) to avoid biases, drawing from [11]. To gather information about food perceived qualities, we have avoided any wording that imposes unwarranted assumptions. For example, in question 20, instead of using the attribute ‘valuable’ to investigate food qualities, we adopted the neologism fupy, a portmanteau of food and happy: nudging the respondents to think about an actual situation where food intake made them happy, we strayed away from ideological biases of what values should be associated with food. Keeping in mind that behaviors are highly regulated by situations, we have framed questions about recommender systems without constraining the domain to the food one, to make sure that respondents could rely on experienced situations. All questions called for a binary or multiple choice answer apart from questions 17 and 20 which were open-ended. To process the answers, we have utilized the software Sketch Engine with its word-sketch function: we have extracted collocations, series of terms that co-occur more often than what shall be by chance and ordered them for frequency.

3.2. Focus Groups

Focus group included 8 Italian mothers living in various locations in the UK with demographic features representative of the traits emerged from the quantitative questionnaire. We organized four sessions of 90 minutes, each one held on Zoom across a period of 3 months. To accommodate participants’ agendas, each session has been repeated twice with smaller groups (4-5 participants each). The participants were recruited through the same media channels used to advertise the questionnaire. As incentives, they have been offered a free consultation with the Libraway dietologist and subsequent tailored diet; they have then been given an honorarium of £80 pounds in the form of a Love2card.

From an epistemological perspective, the focus groups were aimed at more deeply understanding the sense-making process of the quantitative results in relation to the role played by creativity in aiding healthy nutrition choices. During each focus group, a researcher played the role of a mediator showing a set of data, presenting the issues to be discussed and moderating the argumentative discussion. To facilitate discussion, the mediator has behaved as architect of the argumentative dialogue, stressing common starting points (e.g. “it seems that pizza features as a fupy food for the majority of mothers") as well as facilitating the creation of dialogue spaces to deep dive into controversial aspects (e.g., “Does everybody think the same”?). Each focus group has been recorded and transcribed with the software otter.ai. The accuracy of the automatic transcriptions has been, then, manually checked by the mediator and changes have been made where necessary.

The analytic reconstruction of the argumentative discussions included the *argumentation structure* [8], namely the points under discussion (issues); the opinions held by the participants (standpoints); the reasons (arguments) supporting or attacking them; and the types of reasoning (argument schemes) linking the arguments to the standpoints (e.g. argument from means to goal).

4. Results of the analysis

4.1. Audience demand: what makes you *Fupy*?

The answers to question 20 show trends both when it comes to food triggering fupyness and associated qualities. In response to Q20.1., 60% of the respondents have chosen to describe a dinner meal, while 40% a lunch one. To visualize the most frequent types of fupy foods we have extracted collocations considering, respectively, noun modifiers of “dinner/lunch”, noun modified by “dinner/lunch” and coordinative constructions (e.g.“dinner and pizza”) through the Word Sketch

option in Sketch Engine [1] (Figures 1 and 2):

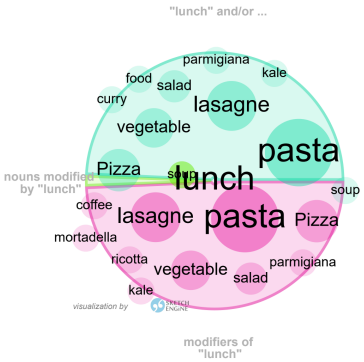

Figure 1: Noun modifiers of 'lunch'.

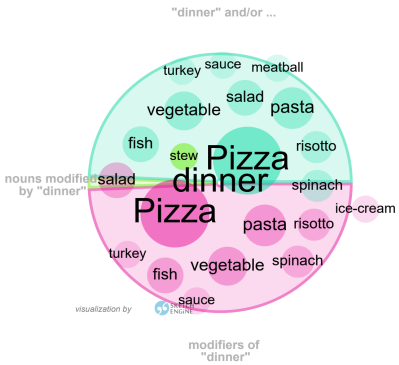

Figure 2: Noun modifiers of 'dinner'

Looking at absolute frequencies, pizza, pasta and vegetables are the 'fupiest' foods across the board with a preference for pasta at lunch and pizza at dinner. Zooming into the most frequently associated qualities, they are more or less the same (Figure 3). To understand how they pattern with each other we have looked at the most frequent co-occurrences (see Figure 4):

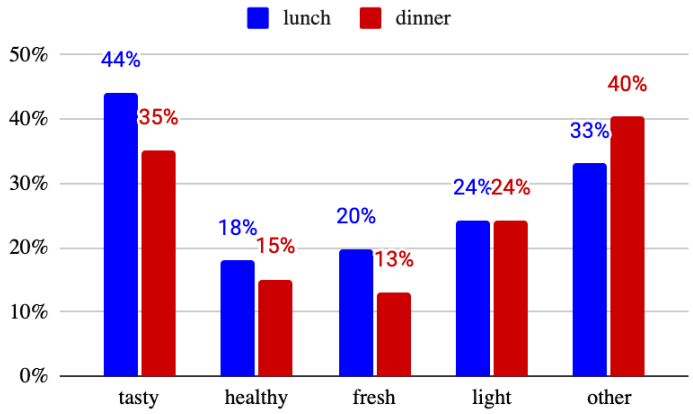

Figure 3: Most frequent food qualities for 'lunch' and 'dinner'

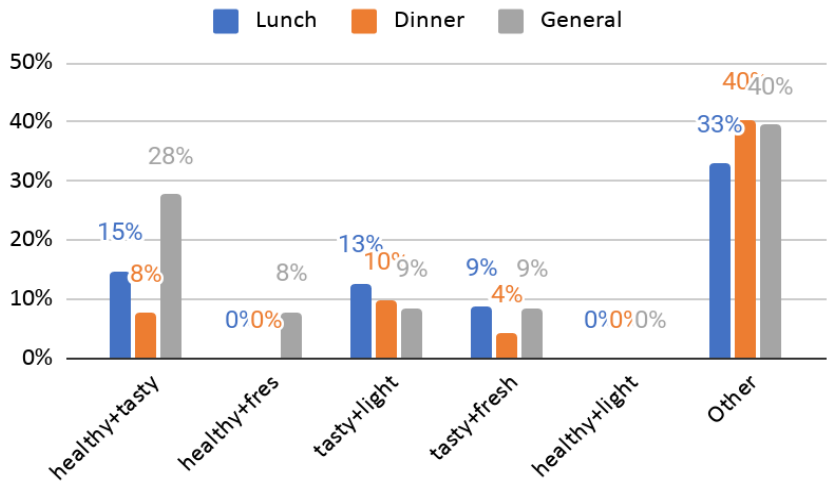

Figure 4: Most frequent food qualities co-occurrences

Interestingly, "healthy" (28%), "tasty" (40%) and "fresh" (23%) have emerged as the most frequent qualities also in response to question 17 where the concept of "happiness" is replaced by that of "satisfaction". However, since the denotation of these terms is hard to distinguish from their connotation in their colloquial use, we asked the participants of our focus group to discuss the meaning of these terms. Questions asked to participants were aimed, first of all, at understanding the meaning of such adjectives according to them. From discussing and reflecting about the difference and the associations between the adjectives, the participants came to the following shared understanding of these food qualities:

- Healthy: Food is healthy because of how it has been cooked and prepared.
- Tasty: Food is tasty because it has good flavour.
- Fresh: Food is fresh because it is made of seasonal/fresh ingredients
- Light: Food is light because it contains a low amount of calories

When asked whether they would associate "tasty" to savoury and/or sweet food, some disagreement arose: while some participants would consider both as good candidates, others associated it to the savoury food only. These folk conceptions constitute useful information for building a human-centered recommendation system. As in any other type of argumentative discourse, it is first of all crucial to enucleate common starting points to build upon: on the one hand, the interaction with the recommender system would not be felicitous if the main argument for a food choice (e.g. the fact that it is "healthy") fails to meet users' expectations. On the other hand, it is very unlikely that someone you trust would not, for example, know your tastes. We, thus, propose to embed questions aimed at revealing users' conception of fupyness in food coaching apps' onboarding plans.

4.2. Topical potential: what type of digital recommendations do you trust?

From the online questionnaire it emerged that 88% of the participants have used/have been using a recommendation system of some sort and 45% deem somewhat likely that recommendation systems would suggest something that they like. The types of items they follow recommendations the most are (i) food (15%), (ii) recipes (9%), (iii) music (8%), (iv) clothes (8%). 66% of the participants have tried a nutrition app having a positive experience (83%). Regardless of previous

experience, 43% of the respondents would trust a digital device to give them advice about healthy nutrition a moderate amount. More in general, the role of recommendation systems in triggering/inhibiting creativity appears to be central in arguments both for and against their use: 37% of the respondents think that RS are useful because they would have never been proactive in looking up the proposed new songs or they feel prompted discovering other songs of the same band (38%) while 46% of the participants think that the major risk is that of ending up listening always to the same genre of music.

During the focus groups, the moderators asked questions aimed at understanding how to improve the efficacy of recommendation systems and the reasons underlying trust beliefs. The questions prompted the participants to argumentatively discuss the following issues: (I) whether and why they trust an app; (II) whether recommendation apps are more or less useful than human ones (III) why people tend to follow recommendation systems for food items rather than other items; (IV) whether bad recommendations are more disappointing for food than other items; (V) what would persuade someone to quit snacking. By examining how participants responded and discussed these questions, we elicited the following factors that can make a recommendation system more effective in stimulating diet creativity and motivation toward positive and continued diet habits:

1. *Personalisation*, i.e. the recommendations should not be too generic. This is why, for instance, recommendations from friends or relatives are often preferred.
2. *Transparency*, i.e. there is understanding of the basis for the recommendation.
3. *Relationship building*, i.e. recommendations appeal to the possibility of sharing of memories and human experience through food.
4. *Positive reviews* by someone with competence and benevolence.

Taken together, these factors call for recommendation systems that do not limit themselves to making suggestions based on past choices, but that are able to appeal to the need for the **human relation component associated with preparing and consuming food**. From the discussion about issues IV, V and VI it emerges that people are more likely to request recommendation on food rather than other items since nutrition is an essential daily activity which is, thus, more prone to trigger boredom. When asked about what makes them disappointed about a failed recommendation, the participants pointed to the face-threatening and embarrassment with friends and relatives as well as the impossibility to share a pleasant mealtime with them. The key role played by argumentation as a motivational strategy based on reason-giving emerged very well from issue VI (what would you say in order to encourage someone to quit snacking?). Arguments based on offering alternatives and recalling greater goals are more persuasive than directive prescriptions.

4.3. Presentational devices: creative food categories

As underlined by [17] presentational devices are strategic in that they "present something in a certain light, thus defining the situation in a particular way, one that is suitable for the rhetorical aims that the speaker aims to attain". The presence of catchy food categories as recipe filters in a recommendation system prompts the user exploring new recipes, thus getting creative and increasing his/her chances to stick to the diet. Among the types of presentational devices available in a standard conversation [8], the Libraway digital platform is constrained to semantic lexical ones, namely categories' names.

To investigate what categories are perceived as preferable, we compiled a list and discussed them in the first focus group. Table 1 shows the 15 food categories that were presented to the participants with their sources, plus one that emerged from the focus group discussion. First, there were the categories that had been already implemented on Libraway and that included standard ways for classifying recipes, such as "dish type". Then, other categories were added following a competitor

analysis of other food apps based in the US and the UK. The third group of categories was derived from a selection of 26 top food blogs (10 active in the UK and 16 in Italy) top ranked in official classification[2]. Through a manual analysis, we selected non-standard categories and clustered them into four macro groups:

Table 1
Top creative food categories

Source	Category name	Example
Top UK/Italian food blogs	Occasion	Finger food, Bento Box
	Suitability	Recipes for students, for children
	Traditional	Grandma's recipes
	Tools	One pot, air frier
Libraway	Dish type	Appetizer, first course
	Dietary preferences	Vegetarian, gluten free
	Season	Spring/winter ingredients
	Difficulty	Easy, difficult
	Cost	Low, high
	Ingredient-based	With white meat
Libraway competitors	Timing	Quick, slow
	Cuisine type	Spanish, Italian
	Portion size	Small, medium
	Purpose oriented	Energizing, purifying
	Allergies	Dairy, nuts
	What you already have at home	Carrots, beans
FG participants	Weekend/weekdays	Pizza, sandwich

All participants agreed that the four "creative" categories coming from the top food blogs would have triggered their attention and were, thus, worth implementing in Libraway. When asked to rank their preferred categories, the top selected ones were timing (17%), difficulty (14%), cuisine type (14%), what you already have at home (14%). There was agreement in considering quick recipes more prominent daily not only because of the lack of time, but also since requiring less ingredients and thus cheaper. Throughout the discussion, the relevance of a category distinguishing "recipes for weekdays" from "recipes for weekends" emerged to account for the difference in time availability to get creative. An example of the interaction leading to the recipes' choice of categories is already available on *Libraway* at: https://libraway.com/it/ricette.

5. Conclusions

This study tackles the design of recommendation systems as creative triggers, taking as a case study the food coaching domain. While it is recognized that curiosity and creativity boost motivation, RS based on users' past or peers behaviors bring to redundancy rather than innovation, especially in everyday life domains such as nutrition. To design recommendation systems that help users change their nutrition habits, we propose to consider human computer interaction with RS as a case of strategic maneuvering aimed at offering persuasive reasons for users to follow a healthy diet. We explain why and how the three components of strategic maneuvering - choice from the topical potential, adaptations to audience demand and displays of presentational devices, shall be considered when designing a RS. We investigate the relevance of such factors in the food domain through a quantitative questionnaire targeting Italian mothers resident (568 respondents) in the UK, a series of focus groups (8 participants) and social media analysis.

2 https://www.popupmag.it/la-classifica-tutta-al-femminile-dei-migliori-food-blogger-italiani/

As to audience demand, users' perceived food qualities as important clues to tailor recommendations that trigger creative behaviors: while a core of attributes emerged from our results, their folk definitions are not conventional ones. We, thus, suggest asking for such information as part of food coaching apps onboarding plans to build recommendation systems that help users achieve their actual nutritional goals (e.g. proposing recipes that meet users' expectations for the category of 'healthy food'). According to our results, one of the main perceived issues undermining trust in RS is, in fact, the lack of a mutual understanding of decision making processes: while RS do not know what aims and values guide users' choices, users' have no access to their underlying reasoning patterns for suggesting items. At the level of presentational devices, the choice of non-standard recipe category names (e.g. grandma's dinner) plays a role in triggering creative behaviors but needs to be balanced with feasibility. The topical potential of a RS needs to account for these factors: creativity manifests itself not only in terms of variety and originality of proposed solutions, but also in the ability to convey credible and audience-adapted arguments for sustainable food habits.

Drawing from the results of the questionnaire and focus groups, we are planning to observe the efficacy of the devised dialogue system through *Libraway*, monitoring users' changes in drops out behaviors as well as app's reviews.

6. Acknowledgements

This study has been supported by the *Wellcome Trust-Institutional Strategic Support Fund*, Grant no: 165959.

7. References

[1] A. Hunter, Towards a Framework for Computational Persuasion with Applications in Behaviour Change, Argument and Computation 9(1) (2018):15-40.

[2] A. Kilgariff, V. Baisa, J. Bušta, M. Jakubiček, V. Kovář, J. Michelfeit, P. Rychlỳ and V. Suchomel, The Sketch Engine: ten years on. Lexicography 1 (2014), 7–36.

[3] B. J. Fogg, Tiny habits: The small changes that change everything, Houghton Mifflin Harcourt/Eamon Dolan Books, Boston, USA, 2019.

[4] C. Burnay, J. Horkoff and N. Maiden, Stimulating stakeholders' imagination: new creativity triggers for eliciting novel requirements, in: Proceedings of the 24th IEEE International Requirements Engineering Conference (RE), Beijing, China, 2016, pp. 36–45.

[5] C. Chesñevar, A.G. Maguitman and M.P. González, Empowering recommendation technologies through argumentation, in: Argumentation in artificial intelligence, Springer, Boston, MA, 2019, pp. 403-422.

[6] D. Jannach, M. Zanker, M. Ge and M. Gröning, Recommender systems in computer science and information systems–a landscape of research, in: International conference on electronic commerce and web technologies, Springer, Berlin, Heidelberg, 2012, pp.76–87.

[7] D. Norman, Emotional design: Why we love (or hate) everyday things, Basic Books, New York, NY, 2004.

[8] F. H. van Eemeren, Strategic manoeuvring in argumentative discourse, John Benjamins, Amsterdam, 2010.

[9] F. H. van Eemeren, R. Grootendorst, and A. F. Snoeck Henkemans, 2002, Argumentation: Analysis, evaluation, presentation, Lawrence Erlbaum, Mahwah, NJ, 2002.

[10] F. H. and P. Houtlosser, Strategic Manoeuvring in Argumentative Discourse: Mantaining a Delicate Balance, in: F. H. van Eemeren and P. Houtlosser (Eds.), Dialectic and Rhetoric. The Warp and Woof of Argumentation Analysis, Kluwer, Dordrecht, 2002, pp. 131-159.

[11] F. J. Fowler and Fowler Jr, Improving survey questions: Design and evaluation, Sage publications, Thousand Oaks, CA, 2004.

[12] J. Sandvig, B. Mobasher and R. Burke, A survey of collaborative recommendation and the robustness of model-based algorithms, in: IEEE Data Engineering Bulletin, 31(2):3–13, 2008.

[13] L. Floridi, The construction of personal identities online, Mind Mach 21(4) (2011), 477–479. doi: 10.1007/s1102 3-011-9254.

[14] M. Boland, F. Alam, and J. Bronlund, Modern technologies for personalized nutrition, in: C. M. Galanakis (Ed.), Trends in Personalized Nutrition, 2019, pp. 195-222.

[15] M. Pazzani and D. Billsus, Content-based recommendation systems, in: P. Brusilovsky, A. Kobsa and W. Nejdl (Eds.), The Adaptive Web, Methods and Strategies of Web Personalization, volume 4321 of Lecture Notes in Computer Science, Springer, 2007, pp. 325–341.

[16] M.L. Maher and K. Grace, Encouraging Curiosity in Case-Based Reasoning and Recommender Systems, in: Proceedings of International Conference on Case-Based Reasoning, Springer, Cham, 2017, pp. 3–15.

[17] M. A. van Rees and E. Rigotti, 2011, The analysis of the strategic function of presentational techniques, in: E. T. Feteris, B. Garssen and A. Francisca Snoeck Henkemans (Eds.), Keeping in Touch with Pragma-Dialectics, John Benjamins, Amsterdam, 2011, pp. 207-220

[18] P. J Rogers and S.J. Hendrik, Food craving and food “addiction”: a critical review of the evidence from a biopsychosocial perspective, Pharmacology Biochemistry and Behavior 66 (2000) 1, 3–14.

[19] S. Milano, M. Taddeo and L. Floridi, Recommender systems and their ethical challenges, AI & Society 35(4) (2020), 957–967

[20] X. Niu, F. Abbas, M.L. Maher and K. Grace, Surprise me if you can: Serendipity in health information, in: *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 2012, pp. 1-12.

Appendix

APPENDIX: Quantitative questionnaire

Q1 Please select your gender.

o Male

o Female

o Other

Q47 Are you a mother?

o Yes

o No

Q2 Are you pregnant?

o Yes

o No

Q3 Please insert your age.

_____

Q4 Do you live in the UK?

o Yes

o No

Q46 If yes, which part of the UK do you live in?

o England

o Scotland

o Wales

o Northern Ireland

Q48 If in England, which region of England do you live in?

o North West

o North East

o South West

o South East

o West Midlands

o East Midlands

o East of England

o Yorkshire and the Humber

o London

Q49 If you live in the North West, which county of the North West do you live in?

o Merseyside

o Other _____

Q5 Which country were you born in?

o UK

o Italy

o Other

Q6 Which languages do you speak proficiently? (Please select all that apply).

☐ English

☐ Italian

☐ Other

Q7 How many children live at home with you?

o 0

o 1

o 2

o 3

o 4

o 5 or more

Q8 Which category best describes your annual household income?

o 0-20,000 £

o 20,001-32,000 £

o 32,001-45,000 £

o 45,001-58,000 £

o 58,001-80,000 £

o More than 80,000 £

o Prefer not to say

Q9 What is the highest level of education you have completed?

o High school diploma

o Undergraduate degree

o Postgraduate degree

o PhD degree

o Other (Please specify) _____

Q10 Do you normally cook your own meals?

o Yes

o No

Q11 How many people do you usually cook for in addition to yourself?

o 1

o 2

o 3

o 4

o 5 or more

o I don't cook

Q12 Please select to what extent you agree to the following statements.

(1)Strongly agree

(2)Somewhat agree

(3)Neither agree nor disagree

(4)Somewhat disagree

(5)Strongly disagree

To me, it is important to have variety in what I eat on a daily basis. () 1 2 3 4 5

I tend to always eat the same types of food. () 1 2 3 4 5

I would like to lose some weight. () 1 2 3 4 5

I'm interested in healthy eating. () 1 2 3 4 5

I believe that to eat healthy is a matter of habit. () 1 2 3 4 5

Q14 How knowledgeable are you about nutrition?

- o Extremely knowledgeable
- o Very knowledgeable
- o Moderately knowledgeable
- o Slightly knowledgeable
- o Not knowledgeable at all

Q42 Have you ever followed an eating plan?

- o Yes
- o No

Q43 If yes, what have you been following an eating plan for? Please select all the statements that apply.

- ▢ Medical reasons (e.g. diabetes)
- ▢ Allergy
- ▢ Improving wellbeing
- ▢ Pregnancy
- ▢ Losing weight
- ▢ Improving sport performance

Q17 Imagine to be satisfied with what you have been eating during the day. Mention three qualities of the food/dish/meal that you have been eating.

- o Quality 1 _____
- o Quality 2 _____

o Quality 3 _____

Q20 Now, imagine that we are in 2030 and that in English everybody is using the word *fupy*, a blending of “food” and “happy”. To explain a friend who does not know the meaning of the word you:

Q20 Describe the meal that made you feel *fupy* specifying which meal it was (lunch or dinner)

_____

_____

_____

_____

_____

Q21 Mention three qualities of the food that makes/made you feel *fupy* at lunch:

o Quality 1 _____

o Quality 2 _____

o Quality 3 _____

Q22 Mention at least three qualities of the food that makes/made you feel *fupy* at dinner:

o Quality 1 _____

o Quality 2 _____

o Quality 3 _____

Q23 Imagine you are on holiday in an exotic place together with a group of friends. One day, you visit the local market in order to purchase food for the evening. While there, you see some unknown fruit which looks inviting. Rate from 1 to 5 these actions, being 1 the most likely and 5 the least likely.

_____ You ask the vendor information about the unknown fruits comparing them to those you are familiar with

_____ You ask the vendor if you can feel the texture of the fruits and taste them

_____ You ask the vendor about the price of those fruits

_____ You keep walking as you are not really interested in fruits you don't know

_____ You buy the unknown fruit straight away and try it out

Q24 You want to give as a present to the daughter of a friend of yours a handbag. You want the present to be exciting and useful at a time. To make sure that these two criteria are met you think that the best practice is (select 1 option only):

o Ask her mother what type of handbags she has (e.g. brand, colours etc.)

o Ask your daughter what are the most fashionable handbags among the group of friends

o Ask her mother to “investigate” what she finds most important in a handbag

Q25 You need to persuade your friend to exercise regularly. Rate from 1 to 5 these factors, being 1 the most persuasive and 5 the least persuasive.

_____ The activity has to be free of charge

_____ The activity has to be not free of charge otherwise (s)he will not be committed

_____ The activity has to teach her/him a completely new skill

_____ The activity has to teach her/him a new skill that (s)he can share with the partner/close group of friends

_____ The activity promises short term results in terms of fitness

Q45 Have you ever received recommendations about products to buy/songs to listen/recipes to try from social media (eg. Facebook, Spotify), conversational agents (eg. Amazon Alexa) etc?

o Yes

o No

Q26 If yes, which social media/conversational agents have you had experience with (e.g. Facebook, Spotify, Amazon Alexa, Google Home)?

_____

Q27 If you have received recommendations from social media/conversational agents, what type of items do you follow recommendations about?

_____

You are listening to a new song that has been recommended to you by your Alexa. How would you most likely complete the sentences:

Q29 “I think this service is helpful because”...

o I would have never been proactive in looking up this new song

o I would never have the time to look up this new song

o I feel now prompted discovering other songs of the same band

Q30 “I think this service is not helpful because”...

o I don’t feel like being proactive in looking up new bands on my own

o I listen to “new” songs without knowing the albums or even the singers

o I end up listening always to the same genre of music

Q31 If you have received recommendations from social media/conversational agents: in your everyday life, how much is it likely that recommendation systems (e.g. Spotify, Youtube) will suggest something that you like?

o Extremely likely

o Somewhat likely

o Neither likely nor unlikely

o Somewhat unlikely

o Extremely unlikely

Q32 When thinking about recommendation systems (e.g. Spotify, Youtube) how concerned are you about data privacy?

o Extremely concerned

o Somewhat concerned

o Moderately concerned

o Slightly concerned

o Not concerned at all

Q33 How much would you trust a digital device to give you advice about healthy nutrition?

o A great deal

o A lot

o A moderate amount

o A little

o None at all

Q34 Have you ever used a nutrition app?

o Yes (Please specify which one) _____

o No

Q35 If yes, which experience did you have with the nutrition app you used?

o Positive

o Negative

Q36 Would you be interested in trying a nutrition app?

o Yes

o No

Q37 How many meals do you eat per day?

_____

Q38 How many portions of fruit do you eat per day?

_____