Role of unfamiliarity and information on consumers' willingness to try new healthy foods

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ABSTRACT

The purpose of this paper is to examine the role of type of unfamiliarity and information on willingness-to-try unfamiliar healthy native foods in males and females. Specifically, the intuition of "healthy = not tasty" is investigated by probing into the effect of high and low taste expectations in the presence and absence of information on health benefits. Defining *Type of unfamiliarity* of a dish based on its ingredient and format is a unique contribution of this research. This paper uses a 3 * 2 * 2 full factorial experimental design (Type of unfamiliarity * Health Benefits * Taste Expectations; n = 367). ANCOVA was performed to analyse the quantitative data. Findings suggest that the information on health benefits or taste expectations does not have a main effect on willingness to try a new healthy native food, in both males and females. Type of unfamiliarity does not matter for males but females consider it important to try a new food. Males may possibly be inclined towards choosing healthy foods that set high taste expectations; however, providing information on health benefits may lower their interest levels.

1. Introduction

Eating healthy is critical to consumers and society's well-being. However, there are two primary challenges in making people eat healthier. The *first* challenge is that healthy eating cannot be imposed on people, even subtly. Even when it is done, Reactance Theory (Brehm, Stires, Sensenig, & Shaban, 1966) suggests that people would rebound to the eliminated alternative of unhealthy foods. The *second* challenge is that consumers perceive healthy foods as not tasty and less filling; an intuition of '*Healthy = not tasty*' (Suher, Raghunathan, & Hoyer, 2016). Even organic foods are perceived as less tasty (Schuldt & Hannahan, 2013). Studies have established that providing information about the food would facilitate consumers to make their own food choices (Martins, Pelchat, & Pliner, 1997; Pelchat & Pliner, 1995). Hence, the consumer is freed from the feeling of 'imposed decision', which is the solution for the first challenge discussed (healthy food being imposed on people). To combat the second challenge (healthy = not tasty), researchers have suggested increasing the variety of healthful options in the menu; which in turn would help people to choose healthier options (Glanz & Yaroch, 2004). So, a possible solution to convince consumers to make healthy food choices is to provide new varieties of healthier foods, along with appropriate information about the food.

Recent research by Hanson & Yun (2018) suggests that the shareholder value for big food companies increases when they introduce healthy new products into the market. Therefore, food marketers should continue to innovate and bring in more new healthy products into the market which not only benefits the consumers, but also themselves. But, ironically when new food products are introduced, their failure rate is around 72–88% (Aqueveque, 2015). Failure rate of new functional food products is also 80% (Nutraingredients, 2009). Unilever withdrew its soy infused juice, AdeZ in the UK as it did not go well with the consumers. They could not get new buyers as consumers still associated soy with poor taste and texture (Starling, 2008). Coca-Cola's Minute Maid Heart Wise orange juice, enhanced with plant sterols which claims to help lower bad cholesterol was also not successful (Nutraingredients, 2009). The problem is that, even if the marketers try to make healthier products tastier, these may become failures as people are not willing to try them at least once. Thus, the task in hand for the marketers is: to influence consumers to try new varieties of healthy foods that they are offering, without imposing these on them (by providing appropriate information along with the food). This study aims to address this unexplored issue in the literature.

Health claims (e.g. 'Helps fight diabetes') are more impactful when compared to nutrient claims ('Rich in fibre') as the consumer pays for the benefits rather than for the ingredient (Bleiel, 2010). The effect of

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health claims had been studied by earlier researchers but the results have been inconsistent (Kozup, Creyer, & Burton, 2003; Liberman & Chaiken, 1992; Roe, Levy, & Derby, 1999). Also, these studies have not been done in the context of new/unfamiliar foods. Therefore, in view of the conflicting findings, this research intends to study the main effect of information on health benefits on consumers' willingness to try a new healthy food.

In the context of new foods, Pelchat & Pliner (1995) found that providing taste information increases the willingness to try a new food. However, we wanted to find out if this effect holds good in the case of new healthy food too. When a food is already perceived as healthy (from its description or any other framing), it would be perceived as less tasty (Raghunathan, Naylor, & Hoyer, 2006) and consumers might have low taste expectations. However, this view is challenged by few researchers (Werle, Trendel & Ardito, 2013; Luomala et al., 2015) who suggest an inclusive view (healthy is tasty and unhealthy is not tasty). Also, Jo & Lusk (2018) suggest that the belief of 'healthy foods cannot be tastier' is not universal. With this background, we would like to investigate the effect of high and low taste expectations.

Providing taste expectation along with the information on health benefits could help consumers in making healthier food choices (Martins, Pelchat, & Pliner, 1997). While prior research has considered the effect of taste expectations and health benefits separately, it has not considered the combined effect. In other words, research has not studied the effect of health benefits when the taste expectation is set to high/low; this work attempts to study this. Also, this study aims to check for any differences in the effect of health benefits and taste expectations among males and females as few studies have earlier reported that they both differ in their food choices (Jun, Arendt, & Kang, 2016; Verbeke, 2006).

Researchers who have studied the impact of information on willingness to try a new food have either considered whole new fruits or vegetables (Martins, Pelchat, & Pliner, 1997; Mcfarlane and Pliner, 1997). They have not dealt with the role of information in the context of cooked healthy foods, which would be more relevant to restaurants as well as in packaged food industries. In new cooked foods, for example, in 'Quinoa Waffle', either the highlighted ingredient 'quinoa' could be unfamiliar or the format 'waffle' could be unfamiliar or both could be unfamiliar to a person and this type of unfamiliarity of food varies with respect to an individual. This study attempts to address this gap also by defining type of unfamiliarity of the new cooked food based on ingredient and format and by examining the main effect of the type of unfamiliarity on willingness to try.

Hence the present research aims to bridge the lacuna between adaptation of healthy food habits in consumers on one side and difficulties faced by marketers in influencing consumers to try the novel introductory foods on the other. In this context, the role of information on health and taste is examined by using a novel approach of survey based experimental research.

1.1. Underlying theory

Alphabet theory (Zepeda & Deal, 2009) combines the VBN (Values – Beliefs – Norms) theory (Stern, Dietz, Abel, Guagnano, & Kalof, 1999) and ABC (Attitude – Behaviour – Context) theory (Guagnano, Stern, & Dietz, 1995). VBN Theory provides a framework about how attitudes are formed. ABC Theory explains how attitudes are transformed to behaviour.

While Feldmann & Hamm (2015) use the Alphabet theory (Fig. 1) to explain consumers' purchase behaviour of organic and local foods, the researchers of this study use it to develop the conceptual framework in the context of willingness to try new healthy foods. Drawing a parallel between the Alphabet Theory and the proposed conceptual framework (Fig. 2), it can be inferred that consumers would be willing to try a new healthy food (behaviour) because of a belief that these foods are beneficial for their health and also they will taste good too. This would
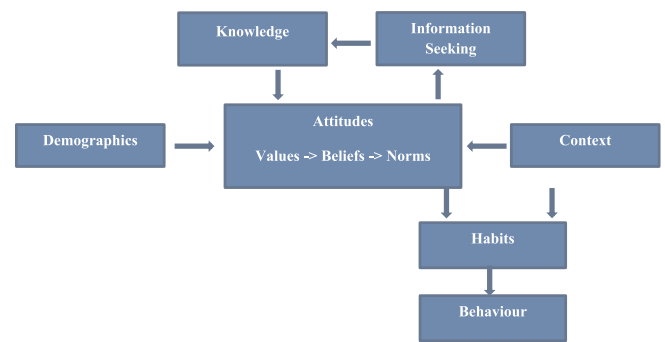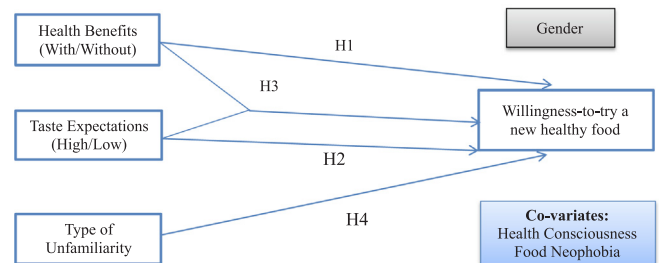

Fig. 1. Alphabet theory (Zepeda & Deal, 2009).

Fig. 2. Conceptual Framework.

further be dependent on the context of the type of unfamiliarity (based on ingredients and format) and level of visual familiarity of the food.

Information seeking behaviour leads to more in-depth knowledge about the new food, thus reinforcing the belief about the benefits of the food and its taste. Traits of being health conscious or being food neophobic (fear of trying new foods) play a key role in the decision of trying out a new healthy food. Gaining knowledge about food and repeated exposures to new foods help in reducing neophobia and thus, trying new foods becomes a learned act. Demographics (gender) is another major factor that influences the decision process.

Referring to the proposed conceptual framework, we intend to study the impact of information (health benefits and taste expectation) on willingness to try various types of unfamiliar healthy foods, while controlling for the influence of food neophobia (reluctance to try new foods) and health consciousness (co-variates) and by using gender as an additional independent variable.

In this research, we consider only native foods (native to India, the setting of this research) since subjects need to be convinced that food is safe for them (Park & Lessig, 1981).

1.2. Hypotheses development

1.2.1. Information on health benefits

We look at how information could influence willingness to try 'new' foods and then at, how it could influence willingness to try 'healthy' foods as this study involves both. Information about ingredients and nutrition plays an important role in developing positive attitudes and in reducing perceived risk (Wansink, Tal, & Brumberg, 2014; Youn & Kim, 2018).

According to Roger's protection motivation theory (Rogers, 1975), more specific information about the recommendations produces greater perceived efficacy of the recommended coping responses and would lead to greater persuasion and behavioural changes (Martins et al., 1997). In other words, providing information about the food would persuade consumers to try that food as they would have an increased positive perception towards its benefits.

Information on a dish's ingredients, the method of preparation and the major nutrients present would enable the person to perceive the

food as a healthy food. Providing health benefits in addition to that information would not have an effect on their willingness to try. Females are believed to show more interest towards healthy foods vis-à-vis males (Padulo et al., 2017). Also, females look more for health benefits and males look for taste information (Jun et al., 2016). But for native foods, the perceived risk would be less (Park & Lessig, 1981) due to the role of ethnicity and hence, they may not be looking for any more information to reduce their anxiety. Hence:

H1a: Presence or absence of information on health benefits will not have a difference among *males* in their willingness to try a new healthy food.

H1b: Presence or absence of information on health benefits will not have a difference among *females* in their willingness to try a new healthy food.

1.2.2. Taste expectations

Pelchat and Pliner (1995) found that the people were willing to try a novel food when they got the information that it tastes good. Manohar and Rehman (2018) propose that emphasising taste vis-à-vis health is preferable.

In the case of native foods, the perceived level of unfamiliarity would be lower in people and hence they would not be concerned about the information on test expectations. Further, Laroche, Kim, and Tomiuk (1999) established that ethnic identity (retention of behaviours and attitudes of a culture) with a culture positively influences consumption of traditional foods that are part of that culture. Therefore, we believe that as long as the food is perceived as healthy native foods, people would be willing to try them without considering the information on taste.

Hence:

H2a: Providing low or high taste expectations will not have any difference in willingness to try a new healthy food in males.

H2b. Providing low or high taste expectations will not have any difference in willingness to try a new healthy food in females.

1.2.3. Interaction between health benefits and taste expectations

The intuition of 'healthy = not tasty' is implicit and people make choice decisions accordingly even though they report that they don't believe in that idea (Raghunathan et al., 2006). According to this intuition, consumers would assume that a food that makes a health claim does not taste as good as a food without such a claim (Naylor, Droms, & Haws, 2009).

There is support in the literature that males prefer good taste over health (Jun et al., 2016). When high taste expectation is given along with the food, complying with their intuition, males don't expect any information on health benefits that accompany it. On the contrary, if they receive information on health benefits, according to Social Judgement Theory (Sherif & Hovland, 1961), they tend to reject the information. People compare an idea presented to them (stimulus) with their existing point of view (anchor) and if the stimulus falls in the area of rejection, persuasion is unlikely. Therefore:

H3a. Willingness to try a new healthy food would be higher in males when no health benefits are provided along with high taste expectations than when health benefits are provided along with high taste expectations.

As opposed to males, females prefer health benefits and they would be more willing to compromise on taste for health (Verbeke, 2006). Vadiveloo, Morwitz, & Chandon (2013) also stated that females give less importance to taste, consume less and yet feel satiated when provided with a health label ('healthy') rather than a taste label ('hearty'). However, because of the intuition in consumers' mind that health and taste cannot go together (Raghunathan et al., 2006), we posit:

H3b. Willingness to try a new healthy food would be higher in females when health benefits are provided along with low taste expectations than when health benefits are provided along with high taste expectations.

1.2.4. Type of unfamiliarity

Aqueveque (2015) bifurcates unfamiliar food into unknown food (unknown ingredients) and novelty combination food (known ingredients combined in a novel or unusual way). But his study leaves two lacunae, firstly, cooked and uncooked foods were not differentiated among the novelty foods and secondly, unfamiliarity was determined based on the context of the society and not with respect to the individual.

Addressing these two gaps, for this study, 'Unfamiliarity' is considered a stimulus which an individual has not experienced, irrespective of whether it is unfamiliar to his/her society.

A report on functional food failures indicate that consumer acceptance of new and unfamiliar ingredients is usually a slow process and many of the failures are due to the company choosing an ingredient new to customers (Nutraingredients, 2009). However, there is a dearth of academic research in this dimension of viewing 'unfamiliarity' based on ingredient and format. This study defines three types of unfamiliarity of a new food based on the unfamiliarity towards the main ingredient and the format of the dish:

a) Type 1 – Unfamiliar ingredient cooked in familiar format (UI-FF)
b) Type 2 – Familiar ingredient cooked in unfamiliar format (FI-UF)
c) Type 3 – Unfamiliar ingredient cooked in unfamiliar format (UI-UF)

The degree of unfamiliarity towards Type 3 food would be higher as Hoeffler (2003) found that uncertainty towards a completely unfamiliar product (both ingredients and format are unfamiliar in Type 3) would be more than that towards an incrementally new product. Higher the degree of unfamiliarity, lower will be the willingness to try that food (Aqueveque, 2015) in both males and females. Therefore, we propose the following hypotheses:

H4a: Willingness to try will be lower for Type 3 unfamiliar healthy food than for Type 1 or Type 2 in males.

H4b: Willingness to try will be lower for Type 3 unfamiliar healthy food than for Type 1 or Type 2 in females.

2. Methodology

Summarizing the hypotheses framed in the previous section, this research proposes that providing/not providing health information alone will not make a difference for both males and females in their willingness to try a new healthy food. Likewise, providing high or low taste expectations alone will not make a difference for them. However, for males, the "high taste expectations + no health benefits," combination would work better while for females, the "health benefits + low taste expectations" combination would work better. For both males and females, we expect Type 3 unfamiliar foods (unfamiliar ingredient in unfamiliar format) to be the least preferred type.

To operationalize the testing of the above hypotheses, we study the following effects of 3 factors – *health benefits, taste expectations* and *type of unfamiliarity* on '*consumer willingness to try an unfamiliar healthy food*' in the native foods category by using *food neophobia* and *health consciousness* as co-variates and by using *gender* as an additional independent variable.

a) Main effect of presence or absence of *health benefits* (in both genders: H1a, H1b)

b) Main effect of the presence of high or low *taste expectations* (in both genders: H2a, H2b)

c) Interaction effect of *health benefits* and *taste expectations* (in both genders: H3a, H3b)

d) Main effect of *type of unfamiliarity* (in both genders: H4a, H4b)

Therefore, 3 * 2 * 2 full factorial, between-subject experimental design [Type of unfamiliarity (Type 1, Type 2, Type 3) * Health Benefits (with/without) * Taste Expectations (Low/High)] was employed to test the hypotheses.

Table 1
Demographic Details.

	Frequency	Percentage
Gender		
Males	166	45%
Females	201	55%
Age		
18–24	152	41%
25–30	141	38%
31–35	33	9%
36–40	31	9%
41–45	10	3%
Education		
High School	4	1%
Graduate	131	36%
Post Graduate and doctorate	232	63%
Employee Status		
Student	237	65%
Employed	99	27%
Self Employed	8	2%
Homemaker	15	4%
Not Employed	8	2%
Annual Family Income		
> 15 lakhs	75	21%
10 to 15 lakhs	72	20%
5 to 10 lakhs	92	25%
3 to 5 lakhs	61	17%
< 3 lakhs	62	17%
Marital		
Married	102	28%
Single	265	72%
Living Style		
Nuclear Family	157	43%
Joint Family	51	14%
Bachelor/Other	158	43%
Native area – Domicile		
South	231	63%
North	136	37%

2.1. Sample

Food Neophobia increases with age (Dovey, Staples, Gibson, & Halford, 2008). Beyond middle age (> 45), there may be other factors like health issues which would contribute to reluctance to try new foods. So, the subjects were chosen from urban areas in India between the ages 18 to 45. Care was taken to have almost equal distribution of people from North and South India, who have distinct differences in their cuisines (sample size = 367, males = 45.2%). Table 1 provides the demographic details of the participants in the study.

Mean value of health consciousness was found to be 3.32 (min: 1, max: 5). 296 out of 367 (80.6%) participants had above average health consciousness (> =2.5). Mean value of food neophobia was found to be 2.49 (low: 1, high: 5). 177 out of 367 participants (48%) had below average level of food neophobia (< 2.5). High level of health consciousness (Nielsen, 2015) and low level of neophobia (Siegrist, Hartmann, & Keller, 2013) is characteristic of young educated consumers and thus the sample was fairly representative of the young educated Indians (18 to 45 years). Their beliefs and motivation were similar to that of the young Indian population.

Non-probability approach of purposive and snowball sampling methods were adopted for data collection. There were three types of unfamiliar dishes (4 different treatment conditions for each dish). After few subjects were identified for one of the treatment conditions for a particular dish, snowballing technique was used to circulate the survey through them with people who share a similar food culture and customs so that the dish identified is unfamiliar to them as well. Standard statistical sampling requires the sampling frame, but people for whom the given dish would be new are geographically dispersed (hidden population) and constructing sampling frame becomes difficult. In such cases, snowball sampling is helpful (Heckathorn, 2011).

2.2. Design

The current study establishes unfamiliarity such that, even if the subject is able to recognise the ingredient or format in the dish but has not experienced it by consuming, it is still considered unfamiliar to him/her. As Martins et al. (1997) have suggested, only new non-animal foods were considered. A picture of the new food was shown in the survey (i.e. instrument) along with the basic description about the food like the main ingredient and other ingredients present. A short explanation about how it is prepared and the nutrients present (like rich is fibre, iron etc.) was also given. Manipulations were in built in the 12 different versions of the instrument representing the 12 treatment conditions. That is, for the respective treatment conditions, health benefits or taste expectations or both were provided below the image of the dish (the dish itself was manipulated according to Type of Unfamiliarity) along with the other details mentioned above [Refer to Fig. 3]. The respondent's willingness to try that food was measured in

Mudakkathan Keerai Dosa

A dosa with a slight bitterness of spinach, made with Mudakkathan Keerai (Baloon vine - a type of spinach). Tastes good with onion or tomato chutney.
Other Ingredients: Rice, urad dhal, fenugreek seeds. Mudakkathan is rich in antioxidants.

EFFECTIVE IN CURING JOINT PAINS. 9 OUT OF 10 PEOPLE SAID "TASTES GREAT".

Fig. 3. Manipulations.

the survey.

2.3. Procedure

The surveys were hosted online using google forms and were collected through offline mode as well. We collected data pan-India from graduate and post graduate students from various universities. Apart from students, working professionals, self-employed people and homemakers were also contacted. Participation in the study was voluntary and not incentivized. During both online and offline modes of data collection, subjects were advised not to use the Internet or discuss with others to check about the dishes until they finished answering the questionnaire. The target was to achieve a sample size of 30 for each treatment condition, in accordance with the suggested sample size (Hair et al., 2015). Our final sample size was 367. Please see Table 1 for details on the sample.

2.4. Stimuli and manipulation checks

According to the "Type of Unfamiliarity" represented by the treatment condition (Type 1, Type 2 and Type 3), the image of the dish and the details shown in the instrument were manipulated. Also, according to the treatment conditions of "With health benefits", "Without health benefits", "High taste expectations" and "Low taste expectations", the information displayed below the image of the dish were manipulated in the instrument. Please refer Table 2 for details regarding manipulations. The sample dishes used for the study were Indian ethnic foods, perceived as *native* foods by the subjects.

The first page of the survey had the image of the dish along with the basic description and the manipulated information. The second page of the survey included two levels of manipulation checks.

The first level of manipulation check was to verify whether that dish

Table 2
Manipulations.

Manipulation Variables	
Type of unfamiliarity	
Type 1 (UI-FF)	Dish presented: Mudakkathan Dosa
(Unfamiliar ingredient in familiar format)	*Mudakkathan – ingredient* *Dosa – Format*
Type 2 (FI-UF)	Dish presented: Corn Adai
(Familiar ingredient in unfamiliar format)	*Corn – ingredient* *Adai – Format*
Type 3 (UI-UF)	Dish presented: Kavuni Sankati
(Unfamiliar ingredient in unfamiliar format)	*Kavuni – ingredient* *Sankati – Format*
Taste Expectations	
Low taste expectation	3 out of 10 people said "TASTES GREAT" (Pelchat and Pliner, 1995; Salmon et al., 2013)
High taste expectation	9 out of 10 people said "TASTES GREAT" (Pelchat and Pliner, 1995; Salmon et al., 2013)
Health Benefits	
Without health benefits	No information was presented about health benefits
With health benefits	The following information was presented according to the type of unfamiliarity of food presented in the survey:
	"Effective in curing joint pains" (Type 1)
	"Improves immunity and beneficial for digestive system"(Type 2)
	"Helps fight diabetes"(Type 3)

which was intended to represent a particular type of unfamiliarity was indeed appropriate with respect to the respondent to whom the survey was administered. For example, when UI-FF (Type 1) food was presented in the survey, we checked whether the dish and the ingredient are new to the respondent and whether he has tasted the format already. If the manipulation check failed, in case of online survey, the respondent was given a link to one of the other two versions that represented another type of unfamiliar food. Out of the 511 participants, since 37 subjects had tasted the dish already and 83 subjects had either tasted the ingredient or the format, they were redirected to a different type of unfamiliar food In case of offline mode also, the assignment of a participant to a treatment condition was controlled by confirming their unfamiliarity with the dish provided in that version of the questionnaire.

The second level of manipulation was to verify if the respondent read the message on health benefits and about the taste expectations which was given in the first page. For example, the question read as "Did you notice the information present along with the description, "Effective in curing joint pains. 9 out of 10 people said 'tastes great'? " [yes/no]. Even if the respondent had missed reading that message in the first page below the image of the food, by answering this question, he/she is made aware of the information present. Also, there was a 5 point scale question on "What do you think about the healthiness of the dish" [Very unhealthy …..Very healthy] to check if the respondent considers the given dish as healthy. To check whether the respondent interpreted the taste expectations appropriately (high or low), the following question was asked "How do you think the taste of the dish would be?" [Very good/Not so good]. The records which failed the second level of manipulation checks (18 records) and records with missing data (6 records) were removed before further data analysis, thus resulting in 367 valid records for further data analysis.

2.5. Measures

For the endogenous variable 'willingness to try', an existing scale was used (Flight, Leppard, & Cox, 2003; Pelchat & Pliner, 1995). According to ABC theory (Guagnano, Stern, & Dietz, 1995), attitudes (stemmed from values and beliefs) are transformed into behaviour. The health consciousness scale (Gould, 1988) measures to what extent the participants are health focused which will reflect in their willingness to try a healthy food. Similarly, the food neophobia scale (Pliner & Hobden, 1992) measures to what extent the participants are willing to compromise on taste and try new foods (one of the items: *I will eat almost anything*). Consumers' willingness to try healthful alternatives is negatively associated with food neophobia (Schickenberg, Van Assema, Brug, & De Vries, 2008; Siegrist, Hartmann, & Keller, 2013; Stratton, Vella, Sheeshka, & Duncan, 2015). Hence, food neophobia and health consciousness were used as co-variates. They were measured in the instrument after 'willingness to try' using the scales mentioned above.

2.6. Pre-test

A pre-test was conducted with a set of few health practitioners and experts to check if the three unfamiliar native foods chosen for the study were perceived as healthy. Also, pre-test was done with some experts to check if the dish chosen for each type of unfamiliarity was an appropriate representation for majority of the people.

2.7. Data analysis

ANCOVA was done using SPSS statistical package, with dependent variable as 'willingness to try a new healthy food' and co-variates as Food Neophobia and Health Consciousness. Fixed factors were the Type of Unfamiliarity, Taste Expectation, Health benefits and Gender. Analysis was done by splitting the data for males and females. Since both online and offline data collection was performed, we checked for

Table 3
Summary of ANCOVA Results.

	Type III SS	df	Mean Square	F	P	Effect size ($\eta\rho^2$)	Effect Size (ω^2)	Power
Males (n = 166)								
Type of Unfamiliarity	5.51	2	2.75	2.08	0.13	–	–	–
Health Benefits	0.39	1	0.39	0.30	0.59	–	–	–
Taste Expectation	0.00	1	0.00	0.00	0.96	–	–	–
Health Benefits * Taste Expectation	4.07	1	4.07	3.09	0.04*	0.02	0.02	0.42
Co-Variates:								
Food Neophobia	13.41	1	13.41	10.17	0.002**	0.06	0.05	0.88
Health Consciousness	2.46	1	2.46	1.86	0.17	–	–	–
Females (n = 201)								
Type of Unfamiliarity	8.76	2	4.38	5.01	0.008**	0.05	0.04	0.81
Health Benefits	0.06	1	0.06	0.06	0.80	–	–	–
Taste Expectation	2.34	1	2.34	2.67	0.10	–	–	–
Health Benefits * Taste Expectation	0.01	1	0.01	0.01	0.90	–	–	–
Co-Variates:								
Food Neophobia	12.29	1	12.29	14.04	0.000***	0.07	0.06	0.96
Health Consciousness	0.49	1	0.49	0.56	0.45	–	–	–

*** Significant at $p < 0.001$; ** Significant at $p < 0.01$; * Significant at $p < 0.05$; + Significant at $p < 0.1$.

any difference in the criterion variable due to the mode of data collection and no difference was found ($p = 0.88$).

3. Results

Cronbach alpha values were calculated to test the reliability of the scales and were found to be 0.821 for food neophobia scale and 0.946 for the health consciousness scale and therefore they were found to be reliable. Since the scale of willingness to try had only one item, Cronbach alpha is not appropriate to report. The conditions of normality, homogeneity of variance, linear relationship between dependent variable and the co-variate, absence of high correlation among the co-variates and homogeneity of regression slopes were verified.

Both the predictor and criterion variables are measured from one subject in a single survey. So, we tested for common method variance (CMV) using Harman's single factor method. Single factor variance was found to be only 34.2% which is less than the cut off of 50%. Therefore, common method bias was not found.

A summary of the results of ANCOVA is presented in Table 3. The co-variate 'Food Neophobia' was significant in both males and females but the co-variate 'Health Consciousness' was not significant in both. The main effects of health benefits was not significant for both males and females, which means 'with health benefits' (WH) or 'no health benefits' (NH) does not make a difference in their willingness to try. Therefore, H1a and H1b were supported. The main effects of taste expectations were also not significant, which means high or low taste expectations do not make a difference. H2a and H2b were supported.

The interaction between health benefits and taste expectations was significant in males. When high taste expectation is provided, they prefer that information on health benefits is not provided. Thus H3a was supported. Also, it was found that males prefer 'No health benefits – High taste expectation' (NH-HT) condition more ($M_{NH-HT} = 3.82$, $M_{WH-LT} = 3.73$, $M_{NH-LT} = 3.49$, $M_{WH-HT} = 3.38$; $F(1,152) = 3.08$,

$p < 0.04$, $\omega^2 = 0.02$) out of the 4 combinations. However, the effect size is small as per the criteria given by Cohen (1992) and possibly therefore, the reported power is on the lower side. Maxwell, Delaney, and Kelley (2017) suggest that the power for the interaction would be around 5 times lower than the power for the main effect. Also they state that the effect size of the interaction is typically lower than that of the main effect. This explains the smaller effect size for the interaction and it would require testing with a much larger sample size to attain the required power for the interaction effect. The interaction effect was not significant in females and therefore H3b was not supported.

The main effect of Type of Unfamiliarity was not significant in males (H4a is not supported) and significant in females (H4b was supported). The main effect in females ($M_{FI-UF} = 4.02$, $M_{UI-FF} = 3.86$, $M_{UI-UF} = 3.48$; $F(2,187) = 5.01$, $p < 0.008$, $\omega^2 = 0.04$) indicate that their willingness to try a Type 2 (FI-UF) food would be higher and Type 3 (UI-UF) would be lower.

The summary of the results of the hypotheses testing is listed in Table 4.

4. Discussion and conclusion

4.1. Effect of information

We found no difference in consumers' willingness to try a new healthy food for the presence or absence of health benefits and also for low and high taste expectations. Consumers seek variety in their food and like to try it, as long as the food is perceived as safe. Foods were perceived as native to the respondents and therefore, they were considered safe to try and their perceived risk about trying the food could have been lesser. Cognitive processing of information is sought only to reduce any perceived risk or uncertainty arising out of unfamiliarity (Pelchat and Pliner, 1995), which is very minimal in the case of native foods. Therefore, their decision of trying the food would not be

Table 4
Summary of hypotheses testing.

S.No	Hypothesis	Results
H1a, H1b	Presence or absence of information on health benefits will not have a difference among males (females) in their willingness to try a new healthy food.	Supported
H2a, H2b	Providing low or high taste expectations will not have any difference in willingness to try a new healthy food in males (females).	Supported
H3a	Willingness to try a new healthy food would be higher in **males** when no health benefits are provided along with high taste expectations than when health benefits are provided along with high taste expectations.	Supported
H3b	Willingness to try a new healthy food would be higher in **females** when health benefits are provided along with low taste expectations than when health benefits are provided along with high taste expectations.	Not Supported
H4a	Willingness to try will be lower for Type 3 unfamiliar healthy food than for Type 1 or Type 2 in **males**.	Not Supported
H4b	Willingness to try will be lower for Type 3 unfamiliar healthy food than for Type 1 or Type 2 in **females**.	Supported

dependent on the health benefit claims or taste expectations.

When offered a new food that is perceived as associated with one's own ethnic group, consumers may try it without requiring any further information about health or taste. Consumers use their choice of food to symbolically define their relationship with their reference group and to prove their ethnical identity (Dittmar, 1992). They would be willing to at least try a native food as they identify themselves with their own ethnic group. But for the long term adoption of the same food in their diet, they may seek and process further information about the food (Finkelstein & Fishbach, 2010). Hence, the consumers who identify themselves with an ethnic group will have a positive attitude towards the consumption of traditional foods that are part of their own culture (Laroche et al., 1999).

Another possibility for the absence of main effect for health benefit claims is that most of the subjects in this study were young and younger people are more influenced by social and environmental factors than personal motivation factors such as health benefits (Mcfarlane & Pliner, 1997). Also, since the health benefits displayed along with the food do not indicate any scientifically proven claim, it may be possible that the information on health benefits did not have a main effect on their willingness to try (Naylor et al., 2009).

The interaction effect between health benefits and taste expectations was significant in males but not in females. The results reveal that when a food is presented with high taste expectation, males prefer without any health benefits than with health benefits, indicating that the intuition that 'health and taste cannot co-exist' is implicit in them. However this finding is suggestive as the required statistical power of 0.80 was not obtained. This interaction effect not being significant in females is consistent with the findings of Mai & Hoffmann (2015), who have stated that males are more likely to subscribe to the unhealthy = tasty intuition (UTI) than the females.

4.2. Effect of Type of unfamiliarity

Type of unfamiliarity of food had a main effect on willingness and this was noticed only in females. Males do not analyse what is 'new' in a food but females seem to be concerned about what makes the food 'new', whether it is the ingredient or format. This could be because females are generally more interested in learning about dish (Worsley, Wang, Ismail, & Ridley, 2014).

Our results indicate that familiar ingredient in new format (Type 2 – *Corn adai* in our study) is the first choice for consumers when compared to dishes prepared with new ingredient either in familiar or unfamiliar format. The result is consistent with the findings of Aqueveque (2015) who established that the degree of familiarity towards a dish made with new ingredients would be lesser than a dish made with familiar ingredients in a novel way. In the literature for new product adoption, Hoeffler (2003) mentions that perceived risk and uncertainty towards a completely unfamiliar product would be more than that towards an incrementally new product. This holds good for food products as well, as consumers reject too much novelty (Costa & Jongen, 2006) and this explains why a dish made with an unfamiliar ingredient in an unfamiliar format is the least preferred choice in our study.

4.3. Theoretical implications

Major multinationals too have not been very successful in introducing products with new ingredients. For instance, Swiss company Emmi's beverage with coenzyme CoQ10, Unilever's soy fruit juice and Coca-Cola's minute maid orange juice with sterol have not made big in the market. Also, the reports on functional food failures indicate that new ingredient should not be projected as a point of difference in marketing new foods (Nutraingredients, 2009). But we find no support for this suggestion in the academic literature. Academic research had ignored exploring new food adoption based on unfamiliarity of ingredient and format of the dish. Our work has addressed this gap in the

academic literature and throws open doors for future researchers to expand knowledge on this area of new food adoption. This is the foremost contribution to the literature.

Secondly, it is also one of the first few studies that have dealt with new cooked foods, rather than whole new fruits or vegetables. Studying adoption of new healthy foods in the cooked foods category would be more relevant for the restaurant industry as well as the food marketers dealing with packaged foods, rather than studying adoption of whole new fruits and vegetables. Thirdly, the study extends the Alphabet theory (Zepeda & Deal, 2009) into the area of adoption of new healthy foods, by introducing the dimension of type of unfamiliarity based on ingredient and format and highlighting its importance.

Fourthly, this study integrates two separate bodies of literature – adoption of new foods and healthy foods into one, as *new healthy foods*. Finally, many studies have scrutinized the effect of health benefits on consumer willingness to try healthy foods (Bleil, 2010) but have not looked at the combined effect of health benefits and taste expectations. This study helped in confirming the inherent "healthy = not tasty" intuition in males and a lesser degree of such intuition in females (Mai & Hoffmann, 2015).

4.4. Managerial and policy implications

The findings from this research would help food marketers in designing appropriate messages on the package label and would help restaurant marketers in designing the content of their menu card, especially when they want to introduce new healthy foods. Marketers are realizing that people are not willing to compromise taste for health and they are trying to increase the hedonic pleasure in their offerings and the challenge for them is to increase the 'first time buyers' (Starling, 2008). According to our findings, if the marketer is offering a new healthy food in the native food category, providing information on health benefits and taste is not necessary. Subtle ways of communicating (by providing nutritional content) such that it is perceived as a healthy food would suffice. The study supports the finding by Wansink (2017) who proposes the CAN approach by positioning the healthy food products in the consumers' mind as "*Convenient, Attractive and Normal*".

The paper demonstrates that a new healthy food is best accepted when it is considered as 'normal'. Even if high taste expectations are provided, we suggest that providing health benefits can be avoided, as it seems to do more harm than good. For instance, in a TV commercial in India by ITC Ltd for the introduction of *Aashirvaad multigrain aatta* (a healthy alternative for Indian staple food, Roti), when the mother brings the rotis mentioning them as 'new', all the family members are shown to be excited to try. But the moment she refers to it as 'healthy', the family members are shown as disappointed and not willing to try. Hence, it is important to let the consumers first perceive the new food as "normal" and not extraordinarily "healthy or nutritious" Once they try the food and find it tasty, the health benefits can be communicated.

This study also helps food marketers in identifying what type of new healthy foods would be preferred by consumers. When new healthy varieties are created in native foods category, the marketers should consider the fact that people are more willing to experiment with different formats prepared with known ingredients (Type 2 in the study) (e.g. Corn Dolmade, Corn Sandwich). However, when a new ingredient is introduced to consumers, it has to be made as a slow process by providing them in a format which they are already familiar with. According to the results from our study, in the Indian context, *Kavuni Sankati*, a dish which is used as Type 3 (unfamiliar ingredient in unfamiliar format) for the experiment would be accepted by the consumers only after they try *kavuni* in a familiar format like *roti* (Type 1 – unfamiliar ingredient in familiar format). This finding is supported by the fact that the Indian market was not very receptive to the traditional millets like kavuni, kodo, little millets etc. when they were introduced 5 years back as packaged grains. But once the restaurants started making in the form of *roti, dosa, savouries* etc. which are known formats,

consumers started to buy these millets in packaged forms. Similarly, we suggest that in the case of U.S consumers, *Chickpea Succotash* (Type 3), an *Alaskan* native dish would be accepted only after they try *Chickpea Stew* (Type 1).

This work is of use to not just managers of food companies, but also policy makers. Governments worldwide try and get their citizens to consume healthy food. For instance, the Food and Drug Administration (FDA) persuades Americans to eat healthy foods by its policy of 'menu labelling' (FDA, 2019). In India, the Food Safety and Standards Authority of India (FSSAI) recently started a movement called "Eat Right India" (eatrightindia.gov.in) and it runs promotion on social media (Eat Right India, 2019). In such advertisements, policy makers may highlight the "normalness" of new food, rather than saying "it is super healthy". Additionally, Government initiatives may come up with new varieties of foods with familiar healthy ingredient in new formats (e.g. In India, *Raagi Wrap – Raagi* is a known ingredient and *Wrap* is a new format) rather than to promote a new ingredient (e.g. olive oil in India is new and it may be hard for consumers to accept this).

4.5. Future research and limitations

While our study made significant contributions, it also was associated with its own set of limitations. First, this research studied only native foods, but many new food products are non-native foods (e.g. corn flakes in India still is a low penetration food); future research can study the marketing of new non-native foods as well. Second, certain intrinsic factors (sensory properties) of food and extrinsic factors (factors of ambience like lighting (Biswas et al., 2017), temperature (Briers and Lerouge, 2011), positioning of item in the menu (Romero and Biswas, 2016) etc.) could affect choice of foods and those are not considered in this study. Third, personal factors like mood and emotions (Wansink and Payne, 2007), ethnocentrism (Camarena, Sanjuán and Philippidis, 2011) also affect choice of foods. We did not study these; future research can incorporate these as well. Fourth, our sample comprised consumers in the 18–45 age brackets. While this is representative of India (the median age is 30 years or so here), others countries like Japan, Italy and Germany are characterised by older populations. Hence, research may replicate our study with a sample of older consumers. Fifth, there may be cultural differences between consumers in terms of acceptance of new healthy food products (Olabi et al., 2009); we did not model these. Future research may hypothesise cross-cultural differences in this domain. Sixth, dishes where an ingredient is not highlighted in the name (e.g. Hummus) were not included in the study and could be considered by future researchers. However, the results of this study are applicable when the information about ingredient and format is provided in the description. Seventh, individual preferences over certain dishes (e.g. Liking or disliking for sandwiches) and visual familiarity with the food (degree to which a new dish looks similar to a familiar dish) could have impacted the results and in this study, we have not controlled for it. Future research may study this aspect as well. And finally, the statistical power for the interaction effect of health benefits and taste expectations in males is slightly lower than the required value of 0.8 and to obtain the required power, the test needs to be performed with increased sample size to confirm the results obtained.

4.6. Conclusion

This study has defined type of unfamiliarity of a food based on unfamiliarity of ingredient and format. Results indicate that for healthy native foods, consumers are more willing to try different formats with a known (rather than unknown) ingredient. This study also found that the perception of "Healthy = Not tasty" is stronger in males than females. This implies that for males, when the food is projected as very tasty, providing health benefits would only end up having adverse effects. However, due to lower statistical power reported for this test, this is

only suggestive and can be confirmed by testing with a larger sample size. While introducing new healthy foods, food marketers should ensure that the food is positioned as "normal". Regular and subconscious cues that would enable the food to be perceived as healthy (from the description or the package) would suffice; mentioning the health benefits explicitly is unnecessary. Our study while making important contributions would also open the doors for more research in this vital area of adoption of new and healthy foods.

CRediT authorship contribution statement

Sujatha Manohar: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Visualization. **Varisha Rehman:** Conceptualization, Methodology, Validation, Writing - review & editing, Project administration, Supervision. **Bharadhwaj Sivakumaran:** Writing - review & editing, Supervision.

Appendix A. Supplementary data

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