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Celebrity insects: Exploring the effect of celebrity endorsement on people's willingness to eat insect-based foods

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ABSTRACT

There is a growing interest in insects as a promising alternative source of protein that can potentially contribute to help solving the imminent global food crisis. However, research on insect-based foods (IBFs) has repeatedly pointed to the fact that, in many countries and cultures, negative attitudes towards eating insects are one of the most significant obstacles to promoting the consumption of IBFs. To date, only a small number of studies have investigated effective strategies to increase the acceptance of those foods. The research reported here focused on the role of celebrity endorsement, which is one of the most prevalent marketing strategies used to promote a wide range of products. We systematically explored whether and how such a strategy might affect the consumers' willingness to eat (WTE) IBFs. Our results provide the first demonstration that celebrities' perceived trustworthiness, knowledge about IBFs, and appropriateness (as an endorser of IBF products) are significant celebrity characteristics affecting people's WTE IBFs. We also found that celebrity type (i.e., actor/actress, musician, or athlete) interacts with participant gender in terms of their WTE those foods. Namely, for male participants, IBF ads featuring actors/actresses or athletes were effective for increasing their WTE those foods. Meanwhile, for female participants, only actors/actresses significantly increased their WTE those foods. Endorsement by a musician did not increase the WTE of either male or female respondents. Together, these findings demonstrate the celebrity endorsement as a prominent strategy to increase the WTE IBFs and reveal how and when the strategy is effective for promoting IBFs.

Keywords: Celebrity endorsement; Insect-based foods; Willingness to eat; Promotion

1. Introduction

Celebrity endorsement is widely used in campaigns for various food and beverage products/brands (e.g., dairy products, snacks, and sugar-sweetened beverages) to induce positive consumer responses for the products advertised (Zhou et al., 2019). Nespresso's "What else?" campaign featuring George Clooney is currently perhaps one of the most famous and successful examples of such a strategy of celebrity endorsement by the food industry. The campaign contributed greatly to increasing brand awareness worldwide and also the company's revenues. After launching Clooney's first ad in 2006, Nespresso's revenues in the same year passed £500m and had reached £2.5bn by 2010 (Cumming, 2020). Could such an endorsement strategy be beneficial for promoting IBFs as well? The research reported here was designed to explore whether and how celebrity endorsement affects the consumers' WTE IBFs.

There is a growing need for alternative protein sources due to the growing global population (Willett et al., 2019). While world meat consumption is predicted to increase by as much as 44% by 2050 compared with 2005 levels, current food production systems simply cannot sustain the world population's estimated future consumption of meat (Collins, Vaskou, & Kountouris, 2019). One promising solution to address the protein crisis is IBFs. Many insects represent an ideal food resource in terms of nutrition (e.g., a good source of protein, good fats, and vitamins) and the environment (e.g., energy-efficient and environmentally-friendly food production; van Huis et al., 2013). However, studies regarding IBFs have repeatedly pointed out that consumers' psychological reluctance toward eating insects is currently the most important obstacle to promoting those foods (e.g., Deroy, Reade, & Spence, 2015; Hartmann & Siegrist, 2017). Several factors may influence the consumers' acceptance of IBFs, such as providing more information through education (e.g., communicating the benefits of entomophagy; Collins et al., 2019), reducing the visibility of insect matter (e.g., process insects

into powders; Baker, Shin, & Kim, 2016), and considering social contexts (e.g., where to eat, whom to eat with; Motoki, Ishikawa, Spence, & Velasco, 2020).

Interestingly, a previous questionnaire survey reported that consumers indicated a willingness to try IBFs if they had been recommended by celebrities (Collins et al., 2019). Indeed, some well-known celebrities (e.g., Angelina Jolie, Nicole Kidman) have apparently already started to adopt edible insects as healthy protein alternatives (Furniss, 2020). Celebrity endorsement is a popular marketing strategy for promoting various food and beverage brands and influences consumers' response to the products advertised (Zhou et al., 2019). However, to date, no study has yet examined the role of celebrity endorsement in the promotion of IBFs. To fill this gap in the literature, the present study explores whether and how celebrity endorsement can increase consumers' WTE IBFs.

Celebrity endorsement can be defined as "an agreement between an individual who enjoys public recognition (a celebrity) and an entity (e.g., a brand) to use the celebrity for the purpose of promoting the entity" (Bergkvist & Zhou, 2016, p. 3). Celebrities gain social influence that can enable them to persuade consumers through various activities in movies, television, music, sports, and social media (Schimmelpfennig & Hunt, 2020). Celebrity endorsement is one of the most prevalent marketing communication strategies worldwide. The estimated rate of celebrity endorsement in Western advertising (e.g., the U.S. and Europe) ranges from 10% to 30% and the figures appear to be higher in Asia (e.g., China and South Korea), ranging from 25% to 60% (Bergkvist & Zhou, 2016；Roy, 2018). Marketing studies of celebrity endorsement suggest that featuring celebrities in advertising influences the consumers' quality perception, brand attitude, and purchase intention for the advertised products (see Bergkvist & Zhou, 2016, for a review).

To the best of our knowledge, the present study is the first to systematically examine the effect of celebrity endorsement on the promotion of IBFs. Our study demonstrates that

celebrity endorsement can be a prominent strategy to increase the WTE IBFs and reveals how and when the strategy is effective for promoting IBFs.

2. Theoretical background and research questions

2.1. The influence of celebrity characteristics

Celerity endorsement has been studied extensively in marketing research for more than half a century now. To date, several models have been proposed as major theoretical foundations of the endorsement effect, including the source attractiveness model, the source credibility model, and the match-up hypothesis (see Bergkvist & Zhou, 2016; Schimmelpfennig & Hunt, 2020, for reviews).

According to the source attractiveness model, the attractiveness of endorsers is the main determinant of the endorsement effect. Previous studies have confirmed that consumers generally prefer physically attractive (e.g., handsome, sexy) endorsers over less attractive individuals, and the physical attractiveness of communicators has a positive effect on consumer attention and evaluation of the products that are advertised (e.g., Wang & Scheinbaum, 2018).

According to the source credibility model, the endorsement effect depends on the perceived credibility of the endorser who recommends a target product. In this model, it is assumed that the perceived level of trustworthiness and expertise of an endorser are the two key determinants of credibility (e.g., Amos, Holmes, & Strutton, 2008). Trustworthiness refers to the perceived attributes of integrity, honesty, and believability possessed by the endorser. Expertise can be defined as the perceived degree of knowledge and skills that the endorser has.

While the source attractiveness model and the source credibility model assume that any celebrity who is attractive and/or credible can effectively endorse any product or brand, the match-up hypothesis suggests that the perceived fit between the endorser and the product or brand is crucial for demonstrating the endorsement effect (e.g., Schimmelpfennig & Hunt,

2020). For example, if a pioneering image is sought for a brand, a celebrity scoring high on adventurous or innovative might be more suitable as a spokesperson.

Based on the above-mentioned arguments, we proposed the following research question (RQ).

RQ1: How do the perceived attractiveness, perceived trustworthiness, perceived expertise (in relation to IBFs), and perceived appropriateness (as an endorser of IBFs) of celebrities influence the consumer's WTE IBFs?

2.2. The influence of celebrity type, celebrity gender, and consumer gender

Celebrities are individuals who are recognized by the general public by name and/or image, such as famous actors/actresses, comedians, musicians, athletes, or chefs who have gained significant popularity and status (Zhou et al., 2019).

Studies of celebrity endorsement suggest that the effect of endorsement on consumer responses may depend on the perceived congruency between the types of featured celebrities and the categories of advertised products (Bergkvist et al., 2016; Schimmelpfennig & Hunt, 2020). For example, it is reasonable to expect that using a famous athlete rather than another type of celebrity (e.g., a musician, actor/actress) would be more suitable for endorsing sports drinks. In addition, the findings of endorsement studies demonstrate that increased image congruence for a spokesperson type/product combination results in higher believability for the spokesperson and a more favorable attitude toward the product being advertised (e.g., Kamins, 1990).

Although, as mentioned above, there exist various types of celebrities, actors/actresses, athletes, musicians are the three most frequently used celebrity types in food and beverage advertising (Hsu & Mcdonald, 2002; Zhou et al., 2019). For example, Hsu and Mcdonald analyzed the content of 'Got milk?' ads appearing on whymilk.com. They reported that 32%

of featured endorsers were actors/actresses, 30% athletes, 22% musicians, 4% models, 2% politicians, and 10% others (e.g., fictional characters).

According to the meaning transfer model, the effectiveness of a celebrity as an endorser of a particular product depends, at least in part, on the characteristics or images that s/he brings to the endorsement process (Roy, 2018). Although it is difficult to explain the exact differences between the three types of celebrities, consumers may attach different meanings or hold different associations for those types as their occupational activities are primarily different. In addition, when we consider the match-up hypothesis mentioned above, the perceived fit between a type of endorser and a product or brand may influence the strength of the endorsement effect.

Not only celebrity type but also celebrity gender may affect the consumers' response to endorsed products. Although to date, the influence of gender on endorsement effects is largely unknown, some studies have suggested that the gender of celebrities, consumers, and their interactions may influence the consumer evaluation of endorsed products (Boyd & Shank, 2004; Klaus & Bailey, 2008). Klaus and Bailey found that the attitude toward an ad for an endorsed juice was higher when the ad featured a famous female soccer player than a male one. They also reported an interaction effect between celebrity gender and consumer gender on the attitude toward the ad. Furthermore, males were found to prefer the ad featuring the female to the male athlete. However, celebrity gender had no influence on female consumers.

Although previous findings of the influence of gender on endorsement effect are still limited, the research suggests that celebrity type, celebrity gender, and/or consumer gender may interact to influence people's WTE IBFs. Based on the above arguments, we proposed the second RQ.

RQ2: Does celebrity type, celebrity gender, consumer gender, and their interaction influence consumers' WTE IBFs?

3. Study

3.1. Method

3.1.1. Design and participants

Prior to the main study, we conducted a preliminary study (N = 112, within-participant design) to explore whether celebrity endorsement has an effect on the WTE IBFs. The study methods and a detailed analysis of the results are provided in Description S2 of the Supplementary Materials. The main study used a 3 (celebrity type: actor/actress, musician, athlete) × 2 (celebrity gender: male, female) × 2 (participant gender: male, female) between-participants design. 1226 North American participants (607 males and 619 females, M_{age} = 37.7 years, *SD* = 10.7) were recruited online via Amazon Mturk in return for a small monetary compensation ($0.15). The ethnic distribution of participants was 79.2% Caucasian, 7.3% Asian, 5.5% African American, 4.6% Hispanic, 3.1% American Indian, and 0.3% multi-ethnicity/other. Among them, 1067 participants (531 males and 536 females, M_{age} = 37.3 years, *SD* = 10.6) were randomly assigned to one of six endorsement conditions (i.e., three celebrity types × two celebrity genders). The gender distribution of participants for each condition was as follows: actor (68 males, 73 females), actress (60 males, 86 females), male musician (68 males, 78 females), female musician (69 males, 91 females), male athlete (74 males, 66 females), and female athlete (75 males, 74 females). The remaining 159 participants (76 males and 83 females, M_{age} = 39.9 years, *SD* = 10.5) were allocated to the control condition (i.e., food ads without endorsers) SurveyMonkey was used to collect the participants' responses.

3.1.2. Stimuli

We selected 36 celebrities consisting of six each of six celebrity conditions (i.e., three celebrity types × two celebrity genders; see Figure S1 of the Supplementary Materials for details). Participants were randomly allocated to one of 36 celebrities. The details of celebrity selection criteria are shown in Description S1 of the Supplementary Materials. Actor/actress,

musician, and athlete were chosen as celebrity types given that, as mentioned above, these professions are frequently featured in ad campaigns across various products (Hsu & Mcdonald, 2002; Zhou et al., 2019).

A cricket bar and mealworm burger were chosen as product stimuli since those are already available in the market and have been used in previous studies on IBFs (e.g., Motoki et al., 2020; Motoki, Park, Spence, & Velasco, 2022). As for the control condition, two fictitious ads were created that did not include celebrity images. In total, 66 fictitious ads were created (i.e., 64 endorsement ads and two ads without an endorser; see Figure 1 for examples).

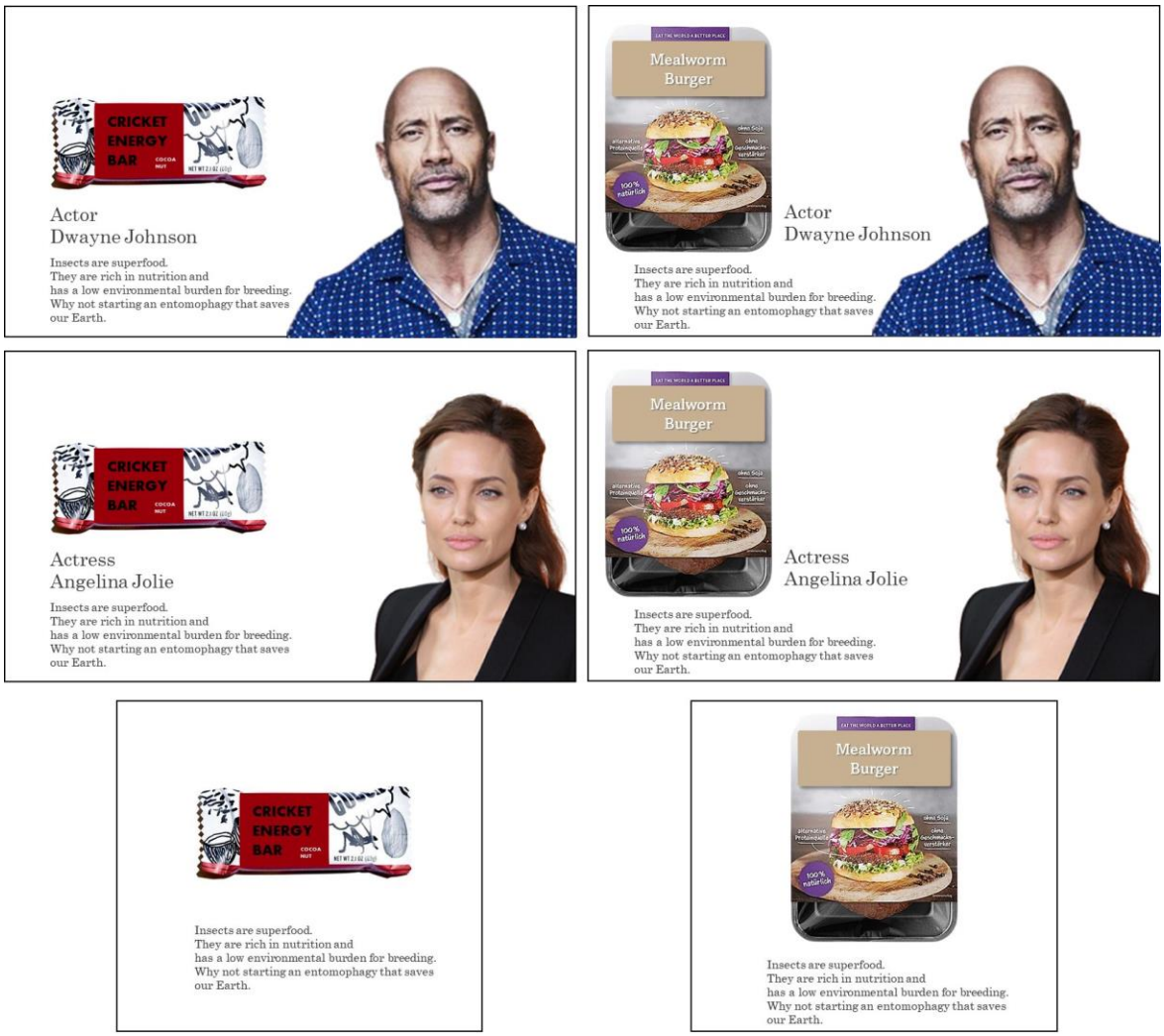

Fig. 1. Examples of ad stimuli used in the main study. The stimuli in the lowest row are the ads used in the control condition.

3.1.3. Procedure

At the start of the survey, the participants received an explanation of what IBFs are with three examples (i.e., pasta with cricket flour, an energy bar made of cricket flour, and a mealworm burger) as well as the main advantages of eating insects (i.e., high nutritional content and low production costs). After providing consent, the participants completed a short survey.

In the survey, individuals were first asked to view the fictitious ads of a cricket energy bar and a mealworm burger endorsed by a celebrity and rated their WTE the bar and burger on a 7-point scale ("I would be willing to eat the energy bar/mealworm burger endorsed by [celebrity name]," 1 = strongly disagree and 7 = strongly agree), respectively. The order of presenting the ads was counterbalanced across participants. Subsequently, they rated perceived attractiveness ("This celebrity is attractive"), trustworthiness ("This celebrity is trustworthy), knowledge of IBFs ("This celebrity is knowledgeable about insect-based foods"), and appropriateness of the celebrity as an endorser of insect-based foods ("This celebrity is appropriate for endorsing insect-based foods") on 7-point scales (1 = strongly disagree and 7 = strongly agree), respectively. As attention checks, the participants were required to choose the type of endorser in the ad (1 = actor/actress, 2 = musician, 3 = athlete) and the gender of the endorser (1 = male, 2 = female). At the end of the study, the participants reported their gender, age, and ethnicity.

The participants in the control condition were asked to view fictitious ads without an endorser and rated the WTE IBFs with the same scale used for the endorsement conditions. The presenting order of the ads was counterbalanced across participants.

3.2. Results

3.2.1. Final sample size and manipulation check

One hundred and eighty-five participants (17.3% of the endorsement groups) failed the attention checks leaving 882 participants for the endorsement conditions. According to a priori power analysis for an analysis of variance (ANOVA) with 12 groups using G*Power 3.1, a minimal sample size of 690 participants to detect a small to medium effect size (f = 0.15, power = 0.95, $\alpha = 0.05$) was indicated. Therefore, the final sample size was sufficient. As all of the final participants correctly answered the type and gender of the endorser in the ads, the manipulations of celebrity type and gender were successful.

3.2.1. Results for RQ1

In order to answer RQ1, we first performed two regression analyses using WTE the energy bar and burger as dependent variables. The independent variables in the analyses were perceived attractiveness, trustworthiness, knowledge about IBFs, and the appropriateness of celebrities as endorsers of those foods. The mean ratings of the measured variables for each celebrity are shown in Table S1 of the Supplementary Materials. As the results for the two foods were mostly the same for all of the analyses reported in this study, we collapsed the two data sets and created the single index of WTE IBFs ($\alpha = .91$) for further analysis.

The regression model was significant and explained 60% of the variance in the WTE (F (4, 877) = 330.13, $p < .001$, Cohen's $f^2 = 1.51$; see Table 1 for details and Table S2 of the Supplementary Materials for the results of each food). All variance inflation factors (VIF) were below 3.4, suggesting the avoidance of multicollinearity. The perceived trustworthiness, perceived knowledge, and perceived appropriateness of endorsed celebrities significantly increased the WTE. However, the influences of perceived attractiveness on the WTE were not significant.

Table 1.

Results of the regression analysis predicting willingness to eat insect-based foods endorsed by celebrities.

	B	SE	*β*	*t*	*p*	VIF
(Constant)	−0.20	0.15		−1.28	.200	
Perceived attractiveness	0.03	0.04	.03	0.87	.383	1.839
Perceived trustworthiness	0.16	0.04	.13	3.76	< .001	2.487
Perceived knowledge	0.41	0.04	.38	9.32	< .001	3.558
Perceived appropriateness	0.35	0.04	.32	8.25	< .001	3.336

Adjusted R^2 = .60

3.2.2. Results for RQ2

Prior to examining the results for RQ2, we examined whether the celebrity endorsement (vs. no endorsement) is more effective for increasing the WTE. An independent *t*-test indicated that the WTE was significantly higher in the endorsement condition than in the control condition ($M_{endorsement}$ = 4.14 vs. $M_{control}$ = 3.64, p = .003, Cohen's d = 0.25; see Table S3 of the Supplementary Materials for details and the results for each food). More nuanced results were found when we compared the control condition and the endorsement conditions in terms of celebrity types (see Figure 2). The results of a one-way ANOVA for celebrity type (F(3, 1037) = 47.61, p < .001, η_p^2 = .12) with Dunnett's test revealed that, compared to the control condition (M = 3.64), the WTE was significantly higher in the actor/actress condition (M = 4.90, p < .001) and athlete condition (M = 4.41, p < .001). Meanwhile, the WTE in the musician condition was significantly lower (M = 3.17, p = .026) than in the control condition (see Table S4 of the Supplementary Materials for details and results for each food).

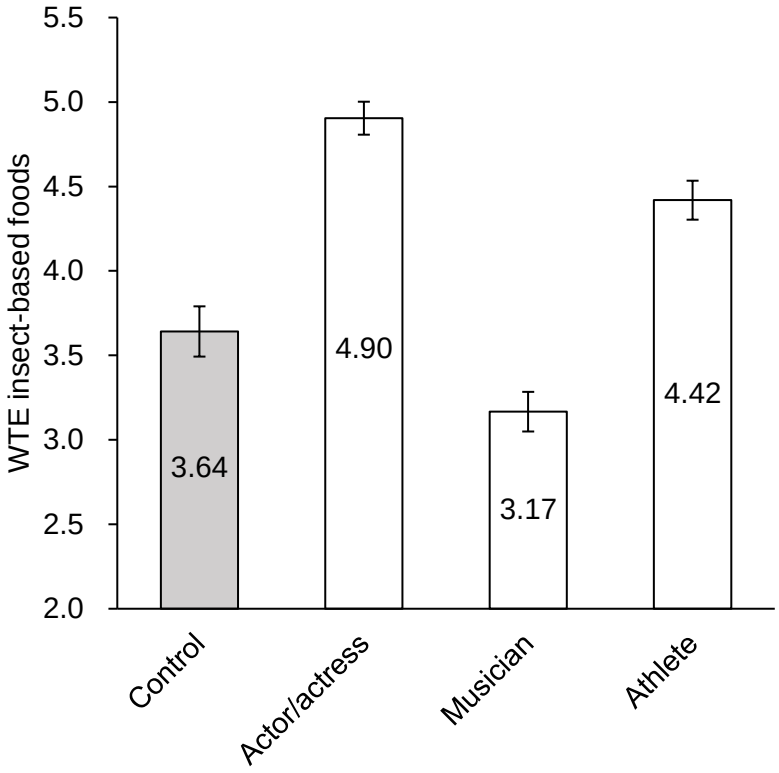

Fig. 2. The mean scores of willingness to eat (WTE) insect-based foods in the control condition and the celebrity conditions.

To address RQ2, we then conducted a 3 (celebrity type: actor/actress, musician, athlete) × 2 (celebrity gender: male, female) × 2 (participant gender: male, female) between-participants ANOVA on the WTE IBFs. The detailed results of the ANOVAs at the aggregated level and for the WTE each food are shown in Table S5 of the Supplementary Materials. The mean scores of the WTE for each celebrity type for each combination of celebrity gender and participant gender are shown in Table S6 of the Supplementary Materials.

The results revealed a significant main effect of celebrity type ($p < .001$). Pairwise comparisons using Bonferroni corrections indicated that the WTE score was higher in the actor/actress condition than in the musician condition ($p < .001$), and in the athlete condition than in the musician condition ($p < .001$). The score in the actor/actress condition was significantly higher than that of the athlete condition ($p = .002$). There was also a significant

main effect of participant gender ($p < .001$). The WTE was higher in the female participant condition than in the male participant condition. Meanwhile, no main effect of celebrity gender on the WTE was obtained ($p = .531$).

Importantly, the main effect of the type of celebrity was qualified by a significant interaction of celebrity type and participant gender ($p < .001$; see Figure 3). Pairwise comparisons revealed that, for males, WTE scores were higher in the actor/actress ($p = .003$) and athlete conditions ($p = .001$) than in the musician condition. Meanwhile, no difference for the WTE was found between the actor/actress group and the athlete group (Bonferroni adjusted $p = 1.00$). Pairwise comparisons for females indicated that the WTE score was higher in the actor/actress ($p < .001$) and athlete conditions ($p < .001$) than in the musician condition. The score for the actor/actress condition was also higher than for the athlete condition ($p < .001$). To further examine the effect of celebrity type on the WTE in males and females, one-way ANOVAs were conducted on the WTE with Dunnett's test for each gender (see Table S7 of the Supplementary Materials for details and the results for each food). The results for the male participants indicated that compared to the control condition ($M = 3.84$), the WTE was significantly higher in the actor/actress ($M = 4.95$, $p < .001$) and athlete conditions ($M = 4.97$, $p < .001$). Meanwhile, the WTE in the musician condition ($M = 4.20$, $p = .324$) did not differ from that of the control condition. For female participants, the results revealed that while the WTE was significantly higher in the actor/actress condition than in the control condition ($M_{\text{actor/actress}} = 4.81$ vs. $M_{\text{control}} = 3.46$, $p < .001$), it was significantly lower in the musician condition than in the control condition ($M_{\text{musician}} = 2.33$ vs. $M_{\text{control}} = 3.46$, $p < .001$). The WTE in the athlete condition ($M = 3.83$) was no different from that of the control condition ($p = .295$).

Two-way interactions between celebrity type and celebrity gender ($p = .623$) and celebrity gender and participant gender ($p = .053$) just failed to reach significance. The three-

way interaction between celebrity type, celerity gender, and participant gender was not significant either (p = .650).

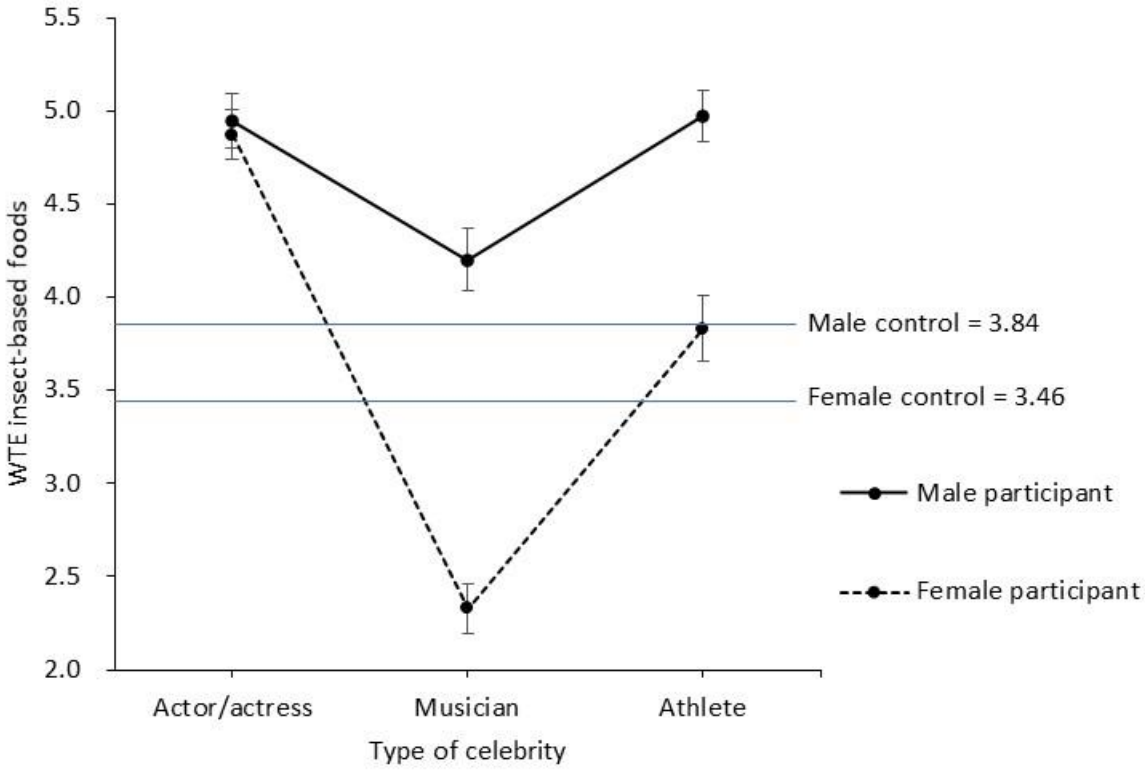

Fig. 3. The interaction between celebrity type and participant gender on the willingness to eat (WTE) insect-based foods.

4. General discussion

Previous studies have repeatedly emphasized the urgent need to research strategies in order to help increase the general public's acceptance of IBFs (Hartmann & Siegrist, 2017). However, to date, only limited efforts (e.g., reducing the visibility of insects, considering the social context of eating IBFs) have been devoted to investigating these strategies. To the best of our knowledge, the current study is the first to systematically examine the effect of celebrity endorsement, which is one of the popular marketing strategies used for promoting various foods and beverages (Zhou et al., 2019), on consumers' acceptance of IBFs by answering the two RQs.

By addressing RQ1, we demonstrate that celebrities' perceived trustworthiness, knowledge about IBFs, and their perceived appropriateness as an endorser of IBFs are crucial factors for increasing people's WTE IBFs. Meanwhile, the perceived attractiveness of celebrities, which is one of the primary sources of the endorsement effect, did not influence people's WTE IBFs. Some studies (e.g., Kamins, 1990) suggest that the physical attractiveness of celebrities influences the consumer's evaluation of the products endorsed, especially when those are attractiveness-related (e.g., cosmetics). As IBFs are far from such categories, the perceived attractiveness of celebrities might not influence the WTE IBFs. To summarize, the results regarding RQ1 suggest that while the source credibility model and the match-up hypothesis predict the effect of celebrity endorsement on the WTE IBFs, the source attractiveness model does not.

By addressing RQ2, we demonstrate that, compared to an ad without an endorser, celebrity endorsement ads significantly increase the consumer's WTE IBFs. However, more detailed analyses reveal that such endorsement effect is conditional on the interaction between the type of celebrity and the gender of the consumer. Our study suggests that while endorsement by an actor/actress or athlete in an ad (vs. an ad without an endorser) contributes to increasing the WTE IBFs amongst male consumers, endorsement by a musician does not. Our results also suggest that while an actor/actress endorsement ad contributes to increasing female consumers' WTE those foods, endorsing an athlete or musician does not. Our results can even be taken to suggest that endorsement (vs. no endorsement) by a musician may decrease the WTE IBFs amongst female consumers. The interaction between celebrity type and consumer gender on the endorsement effect highlights the need for more research on the interplay between endorser and consumer factors in examining the celebrity endorsement effect. To summarize, the findings reported here contribute to the scarce literature on the acceptance and promotion of IBFs.

Our study also provides valuable information for practitioners who might wish to adopt a celebrity endorsement strategy as a promotion tool of IBFs. According to our findings, the process of endorser selection seems to require careful examination of celebrities' perceived trustworthiness, perceived knowledge of IBFs, and appropriateness (as an endorser of IBFs). Our study also suggests that if practitioners consider male consumers as a target group for those foods, it would be preferable to use an actor or an athlete rather than a musician in their marketing promotions. Meanwhile, if a target consumer group is female, using an actor/actress would be more effective for inducing positive consumer responses to IBFs. In addition, it would not be advisable to use a musician to promote those foods when targeting female consumers since an ad featuring a musician may actually decrease the consumer's acceptance of IBFs.

While our study contributes to the literature on the acceptance of IBFs, it has some limitations that offer opportunities for future research. First, our study demonstrates that the type of celebrity and its interaction with consumer gender influence consumers' WTE IBFs. However, we did not examine the underlying reasons for these effects. Presumably, consumers have different associations (e.g., sophisticated, innovative, warm, competent) for different types of celebrity, and such associations may further differ between male and female consumers. These different associations for the celebrity types may be expected to moderate the endorsement effect on consumer responses to IBFs. The meaning transfer model (see Roy, 2018; Schimmelpfennig & Hunt, 2020, for reviews) will be a useful framework for future research in this area.

Second, our study suggests that celebrity endorsement can be a beneficial strategy for promoting IBFs. However, the study results were obtained from examining a limited number of celebrity types. Nowadays, in addition to traditional celebrities (e.g., movie stars, star athletes), many other individuals such as renowned news personalities, authors, business executives, and chefs have also become celebrities (Zhou et al., 2019). Thus, it would be

valuable to examine the effect of new types of endorsers on consumer responses to IBFs for deepening our understanding of the role of endorsement strategy on the acceptance of IBFs. Our study indicates that perceived knowledge (for the IBFs) and appropriateness (as an endorser of those foods) of endorsers are key celebrity characteristics that positively affect consumers' WTE IBFs. In this respect, celebrity chefs (e.g., Gordon Ramsay, Jamie Oliver, Rene Redzepi) might be one of the interesting new endorser types worth investigating. Third, we examined the effect of celebrity endorsement on increasing positive consumer response for IBFs. However, it is highly plausible that celebrity endorsement contributes to accepting IBFs by reducing perceived risk for those foods. Future research could examine the role of celebrity endorsement on reducing negative consumer responses (e.g., perceived risk, feeling of disgust) toward the foods for elaborating the endorsement effect on consumer responses to IBFs.

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Supplementary Materials

Contents

1. Figure

Fig. S1.

Three types of celebrity stimuli used in the preliminary and main study. Note: Actor/actress: numbers 1 to 12. Musicians: numbers 13 to 24. Athletes: from 25 to 36.

2. Tables

Table S1.

Mean ratings of perceived attractiveness, perceived trustworthiness, perceived knowledge for Insect-based foods (IBFs), perceived appropriateness for endorsing IBFs, and willingness to eat (WTE) endorsed IBFs. Note: Values in parentheses are the standard deviations.

No	Name	Celebrity type	Celebrity gender	N	Perceived atractiveness	Perceived trustworthiness	Perceived knowledge	Perceived appropriateness	WTE cricket bar	WTE mealworm burger
1	Dwayne Johnson	Actor/actress	Male	22	5.77 (1.31)	5.59 (1.10)	5.36 (1.68)	5.36 (1.68)	4.64 (1.92)	4.86 (2.10)
2	Ryan Reynolds	Actor/actress	Male	26	5.46 (0.86)	5.31 (1.29)	5.00 (1.44)	5.46 (1.30)	5.08 (1.06)	5.69 (1.23)
3	Mark Wahlberg	Actor/actress	Male	22	5.36 (1.56)	5.36 (1.50)	5.05 (1.44)	5.14 (1.83)	4.50 (2.16)	4.77 (2.39)
4	Ben Affleck	Actor/actress	Male	27	5.59 (1.19)	5.56 (1.45)	5.52 (1.09)	5.52 (1.53)	5.67 (1.21)	5.33 (1.36)
5	Will Smith	Actor/actress	Male	30	5.53 (0.94)	5.73 (0.98)	4.93 (1.44)	4.87 (1.66)	4.50 (1.68)	4.77 (1.76)
6	Adam Sandler	Actor/actress	Male	14	5.00 (1.57)	5.43 (1.28)	4.86 (1.99)	4.86 (2.07)	4.64 (1.87)	4.43 (2.14)
7	Angelina Jolie	Actor/actress	Female	26	5.65 (1.26)	4.96 (1.78)	4.73 (1.71)	5.12 (1.61)	4.69 (1.91)	4.69 (2.11)
8	Gal Gadot	Actor/actress	Female	20	5.95 (1.10)	5.45 (1.05)	5.55 (1.05)	5.30 (1.69)	4.95 (1.64)	4.80 (1.80)
9	Melissa McCarthy	Actor/actress	Female	27	5.44 (1.28)	5.48 (1.09)	4.81 (1.61)	4.78 (1.60)	4.89 (1.45)	5.00 (1.54)
10	Meryl Streep	Actor/actress	Female	31	5.39 (1.33)	5.35 (1.31)	5.29 (1.49)	5.26 (1.51)	4.84 (1.64)	4.77 (1.78)
11	Emily Blunt	Actor/actress	Female	21	5.67 (1.07)	5.38 (1.36)	5.19 (1.54)	5.38 (1.50)	4.81 (2.06)	4.67 (2.08)
12	Nicole Kidman	Actor/actress	Female	21	5.38 (1.16)	5.14 (1.06)	5.14 (1.53)	5.43 (1.54)	5.19 (1.72)	5.14 (1.88)
13	Kanye West	Musician	Male	18	2.78 (1.83)	2.50 (2.04)	2.39 (1.85)	2.56 (1.89)	2.78 (2.37)	2.61 (2.36)
14	Elton John	Musician	Male	26	3.77 (1.68)	3.79 (1.86)	3.38 (1.94)	3.58 (2.18)	3.58 (2.25)	3.00 (2.02)
15	Ed Sheeran	Musician	Male	29	3.14 (1.85)	3.79 (1.86)	3.55 (2.20)	3.17 (1.89)	2.76 (1.90)	2.66 (1.90)
16	Post Malone	Musician	Male	23	3.48 (2.13)	3.74 (2.18)	3.52 (2.17)	3.35 (1.97)	3.43 (2.27)	3.09 (2.13)
17	Shawn Mendes	Musician	Male	24	5.17 (1.49)	4.04 (1.49)	3.58 (2.10)	3.67 (2.01)	3.00 (2.00)	2.67 (2.08)
18	Jay Z	Musician	Male	26	3.62 (1.98)	3.81 (1.60)	3.31 (1.67)	3.19 (1.77)	3.88 (2.18)	3.42 (2.04)
19	Ariana Grande	Musician	Female	27	5.74 (1.29)	4.67 (1.39)	3.44 (1.97)	3.41 (2.02)	3.11 (1.76)	3.15 (2.05)
20	Taylor Swift	Musician	Female	25	4.56 (2.14)	3.84 (1.84)	2.76 (1.96)	2.76 (1.88)	3.08 (2.20)	2.52 (2.02)
21	Billie Eilish	Musician	Female	28	4.39 (1.73)	4.00 (1.76)	3.61 (1.95)	3.82 (1.79)	3.36 (2.02)	3.36 (2.11)
22	Rihanna	Musician	Female	27	5.22 (1.60)	4.81 (1.57)	3.85 (1.79)	3.85 (2.01)	3.78 (2.17)	3.33 (2.29)
23	Lady Gaga	Musician	Female	26	5.04 (1.61)	4.73 (1.78)	3.96 (1.99)	4.31 (1.78)	3.58 (2.37)	3.23 (2.42)
24	Katy Perry	Musician	Female	27	5.26 (1.23)	4.81 (1.39)	3.93 (1.98)	3.44 (2.06)	3.30 (2.28)	3.04 (2.28)
25	Roger Federer	Athlete	Male	23	5.57 (1.56)	5.13 (2.13)	4.74 (1.98)	4.39 (1.88)	4.17 (2.27)	4.30 (2.34)
26	Cristiano Ronaldo	Athlete	Male	22	5.73 (1.75)	5.68 (1.42)	5.64 (1.43)	5.18 (1.59)	4.77 (2.32)	4.64 (2.26)
27	LeBron James	Athlete	Male	21	5.19 (1.37)	5.38 (1.07)	4.19 (1.75)	4.33 (1.71)	4.33 (2.06)	3.62 (2.22)
28	Tiger Woods	Athlete	Male	27	5.11 (1.37)	4.96 (1.22)	4.81 (1.47)	5.11 (1.16)	4.56 (1.89)	4.19 (2.00)
29	Kirk Cousins	Athlete	Male	30	5.30 (1.24)	5.10 (1.35)	4.70 (1.84)	4.87 (1.83)	4.40 (1.92)	4.17 (2.23)
30	Carson Wentz	Athlete	Male	17	5.00 (1.70)	5.12 (1.80)	4.53 (1.77)	5.35 (1.77)	5.00 (1.66)	4.59 (2.03)
31	Naomi Osaka	Athlete	Female	20	5.10 (1.48)	5.65 (1.35)	5.30 (1.26)	5.10 (1.68)	5.00 (1.69)	4.95 (1.50)
32	Serena Williams	Athlete	Female	21	4.95 (1.47)	5.43 (1.25)	5.29 (1.62)	5.33 (1.39)	4.67 (1.91)	4.38 (2.46)
33	Alex Morgan	Athlete	Female	25	5.68 (1.35)	4.96 (1.62)	4.76 (1.81)	4.96 (1.84)	4.76 (1.76)	4.16 (2.10)
34	Maria Sharapova	Athlete	Female	29	5.62 (1.43)	5.38 (1.32)	5.10 (1.18)	5.34 (0.94)	4.45 (2.08)	4.14 (2.15)
35	Ronda Rousey	Athlete	Female	27	5.30 (0.93)	5.26 (1.13)	5.00 (1.41)	4.93 (1.49)	4.19 (1.94)	4.59 (2.17)
36	Hilary Knight	Athlete	Female	27	5.48 (1.05)	5.26 (1.48)	4.78 (1.60)	5.30 (1.38)	4.33 (2.47)	4.22 (2.23)

Table S2.

Results of the regression analyses predicting willingness to eat (WTE) the cricket energy bar (a) and mealworm burger (b) endorsed by celebrities.

(a) WTE cricket energy bar

	B	SE	*β*	*t*	*p*	VIF
(Constant)	0.10	0.17		0.58	.562	
Perceived attractiveness	0.03	0.41	.02	0.73	.469	1.839
Perceived trustworthiness	0.18	0.05	.14	3.80	< .001	2.487
Perceived knowledge	0.35	0.05	.32	7.19	< .001	3.558
Perceived appropriateness	0.33	0.05	.30	7.01	< .001	3.336

Adjusted R^2 = .51

(b) WTE mealworm burger

	B	SE	*β*	*t*	*p*	VIF
(Constant)	−0.50	0.17		−2.94	.003	
Perceived attractiveness	0.03	0.04	.03	0.85	.394	1.839
Perceived trustworthiness	0.14	0.05	.10	2.98	.003	2.487
Perceived knowledge	0.46	0.05	.40	9.66	< .001	3.558
Perceived appropriateness	0.36	0.05	.31	7.91	< .001	3.336

Adjusted R^2 = .59

Table S3.

The results of independent *t*-tests for the willingness to eat (WTE) insect-based foods.

	Control (N = 159)	Endorsement (N = 882)			
	M (*SD*)	*M* (*SD*)	*t*	*p*	Cohen's *d*
Aggregated WTE	3.64 (1.88)	4.14 (2.04)	3.06	.003	0.25
WTE cricket energy bar	3.63 (1.94)	4.22 (2.07)	3.49	.001	0.29
WTE mealworm burger	3.65 (2.04)	4.07 (2.19)	2.32	.021	0.19

Table S4.

The results of Dunnett's tests for comparing the willingness to eat (WTE) in the control condition and each condition of celebrity type.

	Control (N = 159)	Actor/actress (N = 287)	Musician (N = 306)	Athlete (N = 289)
Aggregated WTE	3.64 (1.88)	4.90 (1.65)***	3.17 (2.05)*	4.41 (1.96)***
WTE cricket bar	3.63 (1.94)	4.87 (1.69)***	3.31 (2.14)	4.53 (2.00)***
WTE mealworm burger	3.65 (2.04)	4.93 (1.84)***	3.02 (2.12)**	4.31 (2.17)**

Note: *** denotes p <.001, ** denotes p <.01, * denotes p <.05

Table S5.

Three-way ANOVA results of the willingness to eat (WTE) insect-based foods.

(a) Aggregated WTE

Sources	*df*	MS	*F*	*p*	η_p^2
Celebrity type (CT)	2	209.87	24.36	<.001	.13
Celebrity gender (CG)	1	1.26	0.39	.531	.00
Participant gender (PG)	1	235.43	73.33	<.001	.08
CT × CG	2	1.52	0.47	.623	.00
CT × PG	2	61.07	19.02	<.001	.04
CG × PG	1	12.01	3.74	.053	.00
CT × CG × PG	2	1.38	0.43	.650	.00
Error	870	3.21			
Total	882				

(b) WTE cricket energy bar

Sources	*df*	MS	*F*	*p*	η_p^2
Celebrity type (CT)	2	174.85	50.16	<.001	.19
Celebrity gender (CG)	1	1.12	0.32	.571	.00
Participant gender (PG)	1	200.34	57.47	<.001	.06
CT × CG	2	0.29	0.08	.920	.00
CT × PG	2	50.30	14.43	<.001	.03
CG × PG	1	20.95	6.01	.014	.01
CT × CG × PG	2	2.52	0.72	.485	.00
Error	870	3.49			
Total	882				

(c) WTE mealworm burger

Sources	*df*	MS	*F*	*p*	η_p^2
Celebrity type (CT)	2	249.58	67.54	<.001	.13
Celebrity gender (CG)	1	1.41	0.38	.537	.00
Participant gender (PG)	1	273.34	73.97	<.001	.08
CT × CG	2	3.91	1.06	.347	.00
CT × PG	2	72.91	19.73	<.001	.04
CG × PG	1	5.53	1.50	.221	.00
CT × CG × PG	2	0.63	0.17	.844	.00
Error	870	3.70			
Total	882				

Table S6.

Mean ratings of the willingness to eat (WTE) insect-based foods. Note: Values in parentheses are the standard deviations.

(a) Aggregated WTE

	Celebrity gender		Participant gender		
Celebrity type	Male	Female	Male	Female	Total
Actor/actress	4.95 (1.64)	4.86 (1.67)	4.95 (1.64)	4.87 (1.67)	4.90 (1.65)
Musician	3.09 (2.03)	3.24 (2.07)	4.20 (1.96)	2.55 (1.87)	3.17 (2.05)
Athlete	4.38 (1.98)	4.46 (1.95)	4.97 (1.66)	3.83 (2.09)	4.42 (1.96)
Total	4.12 (2.05)	4.16 (2.03)	4.71 (1.79)	3.64 (2.11)	4.14 (2.04)

(b) WTE cricket energy bar

	Celebrity gender		Participant gender		
Celebrity type	Male	Female	Male	Female	Total
Actor/actress	4.87 (1.68)	4.88 (1.71)	4.91 (1.67)	4.84 (1.72)	4.87 (1.69)
Musician	3.25 (2.16)	3.37 (2.12)	4.26 (2.04)	2.55 (1.90)	3.31 (2.14)
Athlete	4.51 (2.02)	4.54 (2.00)	5.04 (1.70)	3.98 (2.15)	4.53 (2.00)
Total	4.20 (2.08)	4.24 (2.06)	4.74 (1.84)	3.76 (2.15)	4.22 (2.07)

(c) WTE mealworm burger

	Celebrity gender		Participant gender		
Celebrity type	Male	Female	Male	Female	Total
Actor/actress	5.03 (1.83)	4.84 (1.84)	4.98 (1.88)	4.90 (1.80)	4.93 (1.84)
Musician	2.92 (2.06)	3.11 (2.18)	4.15 (2.05)	2.11 (1.71)	3.02 (2.12)
Athlete	4.24 (2.17)	4.38 (2.11)	4.91 (1.84)	3.68 (2.26)	4.31 (2.14)
Total	4.05 (2.02)	4.08 (2.18)	4.68 (1.96)	3.53 (2.25)	4.07 (2.19)

Table S7.

The results of Dunnett's tests comparing the willingness to eat (WTE) in the control condition and each celebrity type condition for male and female participants.

(a) The results of Dunnet's test for male participants

	Control (N = 76)	Actor/actress (N = 128)	Musician (N = 137)	Athlete (N = 149)
Aggregated WTE	3.84 (1.89)	4.95 (1.64)***	4.20 (1.96)	4.97 (1.66)***
WTE cricket bar	3.82 (1.92)	4.91 (1.67)***	4.26 (2.04)	5.04 (1.70)***
WTE mealworm burger	3.87 (2.09)	4.98 (1.88)***	4.15 (2.05)	4.91 (1.84)**

Note: *** denotes p <.001, ** denotes p <.01, * denotes p <.05

(b) The results of Dunnet's test for female participants

	Control (N = 83)	Actor/actress (N = 159)	Musician (N = 169)	Athlete (N = 140)
Aggregated WTE	3.46 (1.86)	4.87 (1.67)***	2.33 (1.72)***	3.83 (2.09)
WTE cricket bar	3.46 (1.96)	4.84 (1.72)***	2.55 (1.90)**	3.98 (2.15)
WTE mealworm burger	3.46 (1.98)	4.90 (1.80)***	2.11 (1.71)***	3.68 (2.26)

Note: *** denotes p <.001, ** denotes p <.01, * denotes p <.05

3. Descriptions

Description S1.

Selection criteria for celebrities

The selection was made based on the four celebrity rankings provided by Forbes (https://www.forbes.com) and one celebrity ranking provided by Sports Show (https://sportsshow.net/). Famous actors/actresses were chosen from the top rankers in the highest-paid of 2020 list, respectively, provided by Forbes. We selected male and female celebrity musicians from the top musicians in the world's highest-paid celebrities 2020 (Forbes). Male athletes were chosen from the top rankers in the highest-paid athletes of 2020 list (Forbes). Meanwhile, as most of the top rankers in the highest-paid female athletes of 2020 list (Forbes) were tennis players, we also used the ranking of top 10 most remarkable female athletes in 2020 provided by Sports Show to choose athletes in other sports events. We selected the top two athletes (i.e., Naomi Osaka and Serena Williams) from the Forbes ranking, and the remaining athletes were selected from the ranking provided by Sports Show.

Description S2.

The method and results of the preliminary study

Method

Participants

One hundred and twelve participants (35 females, M_{age} = 34.9 years, SD = 10.4) were recruited via Mturk in exchange for monetary compensation of 3 USD. A 3×2×2 factorial design (within-participant factors: celebrity type and celebrity gender, between-participant factor: participant gender) was used to address RQ2. To estimate the required sample size, an *a priori* power analysis was conducted using G*Power version 3.1. The power analysis yielded a sample size of 86 for a medium effect size (f = .25) with 80% power at an alpha level of .05. Therefore, the number of recruited participants was sufficient. The ethnic distribution of participants was 71.4% Caucasian, 15.2% Asian, 9.8% African American, and 3.6% other. SurveyMonkey was used to collect participants' responses.

Stimuli

Actor/actress, musician, and athlete were chosen as celebrity types given that these professions are frequently featured in ad campaigns across various products (Hsu & Mcdonald, 2002; Zhou et al., 2019). We selected 36 celebrities consisting of six of each of six celebrity conditions (i.e., three celebrity types × two celebrity genders; see Figure S1 for details). The details of celebrity selection criteria are shown in Description S1.

Procedure

At the start of the survey, the participants received the following explanations: what insect-based foods (IBFs) are with three examples (i.e., pasta with cricket flour, an energy bar made of cricket flour, and a mealworm burger), the main advantages of eating insects (i.e., high nutritional content and low production costs), and the purpose of the study (i.e., examining the influence of celebrity endorsement on consumer responses to IBFs). After providing consent, the participants completed a survey lasting for approximately 20-minutes. In the survey, individuals were asked to view each named celebrity portrait and rate perceived attractiveness ("This celebrity is attractive"), trustworthiness ("This celebrity is trustworthy), knowledge of IBFs ("This celebrity is knowledgeable about insect-based foods"), and perceived appropriateness of the celebrity as an endorser of IBFs ("This celebrity is appropriate for endorsing insect-based foods") with a 7-point scale (1 = strongly disagree and 7 = strongly agree), respectively. The participants also rated their willingness to eat (WTE) endorsed IBFs

on a 7-point scale ("I would be willing to eat insect-based foods endorsed by [celebrity name]," 1 = strongly disagree and 7 = strongly agree). This procedure was carried out for all 36 of the selected celebrities (see Table SD1 for the mean scores of the measurements of each celebrity). The order in which the celebrities were presented on screen was randomized in order to avoid order effects in the overall data. At the end of the study, the participants reported their gender, age, and ethnicity.

Results

Results for RQ1

In order to answer RQ1, a multiple regression analysis was performed using WTE endorsed IBFs as a dependent variable. The independent variables in the analysis were perceived attractiveness, trustworthiness, knowledge about IBFs, and the appropriateness of celebrities as endorsers of those foods. The average scores of all independent and dependent variables for all participants were calculated (from the individual participant scores of those variables) for the 36 celebrities.

The regression model was significant and explained 77% of the variance in the WTE the endorsed foods (F (4, 31) = 29.57, $p < .001$, adjusted $R^2 = .77$, Cohen's $f^2 = 3.27$). All variance inflation factors (VIF) were below 4.3, suggesting the avoidance of multicollinearity (see Table SD2). The perceived trustworthiness of the celebrities and perceived appropriateness significantly increased the WTE. However, the influences of perceived attractiveness and perceived knowledge on the WTE were not significant.

Results for RQ2

To address RQ2, a 3×2×2 mixed ANOVA (within-participant factors: celebrity type and celebrity gender, between-participants factor: participant gender) on the WTE IBFs was performed. Mauchly's test indicated that the assumption of sphericity had been violated for the effect of celebrity type (χ^2 (2) = 21.18, $p < .001$), and the interaction between celebrity type and celebrity gender (χ^2 (2) = 27.87, $p < .001$). Therefore, in the following ANOVA tests, degrees of freedom were corrected using the Greenhouse-Geisser estimates of sphericity. The detailed results of the ANOVAs are shown in Table SD3. The mean scores of the WTE of each celebrity type in each celebrity gender and participant gender are indicated in Table SD4.

The results revealed a main effect of the type of celebrity ($p = .029$). Post hoc pairwise comparison using Bonferroni correction indicated that the WTE score was higher in the

actor/actress condition than in the musician condition (p =.012). Meanwhile, the athlete condition was not significantly different from that of actor/actress and musician (ps > .066). A main effect of celebrity gender was also significant (p = .005). The WTE was higher in the female celebrity condition than in the male celebrity condition (p =.012). Meanwhile, there was no main effect of participant gender on the WTE (p = .075).

Importantly, the main effect of the type of celebrity was qualified by a significant interaction of celebrity type and celebrity gender (p < .001, see Figure SD1). Pairwise comparisons using Bonferroni correction showed that, for female celebrity endorsement, the WTE IBFs were not different between the three types of celebrity (all ps > .25). By contrast, the WTE those foods that had been endorsed by male celebrities was higher when the celebrity was an actor than when they were a musician (p < .001) or athlete (p = .014), and when they were an athlete than a musician (p = .019). The results further indicated that the WTE the foods endorsed by female musicians was higher than those endorsed by the male musicians (p < .001).

The main effect of the celebrity type was also qualified by an interaction between celebrity type and participant gender (p = .009). Pairwise comparisons using Bonferroni correction indicated that, for the male participants, the WTE of the foods endorsed by the musicians was lower than that of the actors/actresses (p = .008) and athletes (p = .022). The WTE score in male participants did not differ between the actors/actresses and athletes (p = 1.00, Bonferroni corrected). Meanwhile, pairwise comparisons for the female participants revealed that the WTE of the foods endorsed by an actor/actress was higher than that of the athlete (p = .006). No difference was obtained between the actors/actresses and musicians and between the musicians and athletes (ps > .42). The results further revealed that the WTE of the foods endorsed by the athletes in the male participants was higher than that of the female participants (p = .016). The three-way interaction between type of celebrity, celerity gender, and participant gender failed to reach significance (p = .068).

Table SD1.

Mean ratings of perceived attractiveness, perceived trustworthiness, perceived knowledge of insect-based foods (IBFs), perceived appropriateness for endorsing IBFs, and willingness to eat (WTE) endorsed IBFs. Note: Values in parentheses are standard deviations.

No.	Name	Celebrity type	Celebrity gender	Perceived atractiveness	Perceived trustworthiness	Pereceived knowledge for IBFs	Perceived appropriateness for endorsing IBFs	WTE endorsed IBFs
1	Dwayne Johnson	Actor/actress	Male	5.04 (1.52)	5.54 (1.51)	4.68 (1.64)	4.96 (1.60)	4.91 (1.88)
2	Ryan Reynolds	Actor/actress	Male	5.04 (1.55)	5.01 (1.43)	4.52 (1.61)	4.63 (1.51)	4.46 (1.78)
3	Mark Wahlberg	Actor/actress	Male	4.74 (1.40)	4.79 (1.54)	4.18 (1.62)	4.43 (1.62)	4.16 (1.84)
4	Ben Affleck	Actor/actress	Male	4.85 (1.53)	4.71 (1.61)	4.11 (1.66)	4.36 (1.64)	4.31 (1.82)
5	Will Smith	Actor/actress	Male	4.95 (1.46)	5.38 (1.51)	4.54 (1.63)	4.63 (1.67)	4.58 (1.84)
6	Adam Sandler	Actor/actress	Male	4.30 (1.60)	4.86 (1.57)	4.25 (1.83)	4.38 (1.71)	4.39 (1.85)
7	Angelina Jolie	Actor/actress	Female	5.52 (1.50)	5.20 (1.54)	4.67 (1.66)	4.88 (1.58)	4.67 (1.84)
8	Gal Gadot	Actor/actress	Female	5.47 (1.50)	5.06 (1.48)	4.30 (1.62)	4.44 (1.58)	4.45 (1.75)
9	Melissa McCarthy	Actor/actress	Female	4.25 (1.64)	4.83 (1.63)	4.16 (1.70)	4.29 (1.69)	4.00 (1.85)
10	Meryl Streep	Actor/actress	Female	4.47 (1.68)	4.93 (1.72)	4.24 (1.67)	4.42 (1.77)	4.31 (1.87)
11	Emily Blunt	Actor/actress	Female	5.22 (1.47)	4.90 (1.64)	4.37 (1.69)	4.38 (1.63)	4.26 (1.77)
12	Nicole Kidman	Actor/actress	Female	4.98 (1.54)	4.83 (1.55)	4.34 (1.62)	4.41 (1.65)	4.46 (1.69)
13	Kanye West	Musician	Male	3.84 (1.76)	3.97 (1.81)	3.79 (1.88)	3.84 (1.94)	3.89 (2.00)
14	Elton John	Musician	Male	3.96 (1.76)	4.77 (1.62)	4.06 (1.77)	4.08 (1.71)	4.11 (1.82)
15	Ed Sheeran	Musician	Male	4.08 (1.78)	4.88 (1.68)	4.26 (1.73)	4.26 (1.69)	4.19 (1.82)
16	Post Malone	Musician	Male	3.75 (1.77)	4.26 (1.60)	3.92 (1.71)	4.14 (1.74)	4.10 (1.92)
17	Shawn Mendes	Musician	Male	4.85 (1.55)	4.79 (1.57)	4.39 (1.71)	4.38 (1.60)	4.22 (1.80)
18	Jay Z	Musician	Male	3.92 (1.84)	4.46 (1.64)	4.02 (1.66)	4.00 (1.75)	4.13 (1.87)
19	Ariana Grande	Musician	Female	5.39 (1.45)	4.76 (1.55)	4.21 (1.82)	4.36 (1.83)	4.34 (1.84)
20	Taylor Swift	Musician	Female	5.29 (1.53)	5.13 (1.65)	4.08 (1.76)	4.47 (1.74)	4.45 (1.85)
21	Billie Eilish	Musician	Female	4.35 (1.72)	4.37 (1.72)	3.95 (1.75)	4.21 (1.78)	4.07 (1.95)
22	Rihanna	Musician	Female	5.22 (1.51)	4.90 (1.61)	4.16 (1.70)	4.34 (1.77)	4.41 (1.86)
23	Lady Gaga	Musician	Female	4.95 (1.42)	4.92 (1.60)	4.37 (1.70)	4.60 (1.60)	4.42 (1.82)
24	Katy Perry	Musician	Female	5.04 (1.55)	4.96 (1.56)	4.20 (1.69)	4.44 (1.69)	4.42 (1.83)
25	Roger Federer	Athlete	Male	4.84 (1.61)	4.88 (1.51)	4.40 (1.59)	4.50 (1.55)	4.35 (1.81)
26	Cristiano Ronaldo	Athlete	Male	5.18 (1.55)	5.06 (1.59)	4.55 (1.80)	4.68 (1.72)	4.55 (1.82)
27	LeBron James	Athlete	Male	4.47 (1.52)	5.03 (1.55)	4.34 (1.63)	4.57 (1.65)	4.48 (1.75)
28	Tiger Woods	Athlete	Male	4.36 (1.52)	4.22 (1.80)	4.20 (1.72)	4.17 (1.72)	4.20 (1.88)
29	Kirk Cousins	Athlete	Male	4.65 (1.39)	4.73 (1.41)	4.17 (1.49)	4.48 (1.48)	4.42 (1.74)
30	Carson Wentz	Athlete	Male	4.40 (1.57)	4.50 (1.57)	4.13 (1.50)	4.38 (1.45)	4.21 (1.71)
31	Naomi Osaka	Athlete	Female	4.56 (1.48)	4.81 (1.46)	4.36 (1.44)	4.65 (1.50)	4.30 (1.71)
32	Serena Williams	Athlete	Female	4.44 (1.66)	5.03 (1.48)	4.34 (1.66)	4.78 (1.62)	4.58 (1.81)
33	Alex Morgan	Athlete	Female	5.28 (1.45)	4.72 (1.41)	4.13 (1.51)	4.41 (1.58)	4.22 (1.79)
34	Maria Sharapova	Athlete	Female	5.20 (1.41)	4.87 (1.48)	4.38 (1.58)	4.65 (1.62)	4.46 (1.72)
35	Ronda Rousey	Athlete	Female	4.70 (1.48)	4.66 (1.55)	4.28 (1.60)	4.71 (1.64)	4.28 (1.77)
36	Hilary Knight	Athlete	Female	5.03 (1.33)	4.63 (1.52)	4.40 (1.58)	4.60 (1.57)	4.21 (1.75)

Table SD2.

Results of the multiple regression analysis predicting willingness to eat insect-based foods endorsed by celebrities.

	B	SE	*β*	*t*	*p*	VIF
(Constant)	1.04	0.36		2.88	.007	
Perceived attractiveness	0.03	0.05	.07	0.64	.525	1.736
Perceived trustworthiness	0.29	0.09	.44	3.15	.004	2.907
Perceived knowledge	0.06	0.17	.06	0.34	.738	4.223
Perceived appropriateness	0.35	0.14	.41	2.43	.021	4.170

Adjusted R^2 = .77

Table SD3.

ANOVA results of the willingness to eat (WTE), the perceived trustworthiness, and the perceived appropriateness.

(a) WTE

	Effect		Error				
Sources	*df*	MS	*df*	MS	*F*	*p*	η_p^2
Celebrity type (CT)*	1.70	0.61	186.98	0.16	3.86	.029	.03
Celebrity gender (CG)	1.00	0.97	110.00	0.12	8.21	.005	.07
Participant gender (PG)	1.00	3.15	110.00	0.98	3.23	.075	.03
CT × CG*	1.63	1.89	179.50	0.12	15.37	<.001	.12
CT × PG*	1.70	0.82	186.98	0.16	5.26	.009	.05
CG × PG	1.00	0.04	110.00	0.12	0.34	.561	.00
CT × CG × PG*	1.63	0.36	179.50	0.12	2.91	.068	.03

Note: * Degrees of freedom were corrected using the Greenhouse-Geisser estimates of sphericity.

(b) Perceived trustworthiness

	Effect		Error				
Sources	*df*	MS	*df*	MS	*F*	*p*	η_p^2
Celebrity type (CT)*	1.75	1.88	192.95	0.16	11.58	<.001	.10
Celebrity gender (CG)	1.00	0.69	110.00	0.11	6.23	.014	.05
Participant gender (PG)	1.00	3.40	110.00	0.95	3.58	.061	.03
CT × CG*	1.65	2.47	181.91	0.13	19.35	<.001	.02
CT × PG*	1.75	0.69	192.95	0.16	4.22	.020	.04
CG × PG	1.00	0.01	110.00	0.11	0.13	.719	.00
CT × CG × PG*	1.65	0.48	181.91	0.13	3.73	.034	.03

Note: * Degrees of freedom were corrected using the Greenhouse-Geisser estimates of sphericity.

(c) Perceived appropriateness

	Effect		Error				
Sources	*df*	MS	*df*	MS	*F*	*p*	η_p^2
Celebrity type (CT)*	1.71	1.34	188.27	0.16	8.17	.001	.07
Celebrity gender (CG)	1.00	0.78	110.00	0.11	7.09	.009	.06
Participant gender (PG)	1.00	3.26	110.00	0.96	3.38	.069	.03
CT × CG*	1.64	2.22	180.67	0.13	17.74	<.001	.14
CT × PG*	1.71	0.79	188.27	0.16	4.85	.012	.04
CG × PG	1.00	0.03	110.00	0.11	0.24	.629	.00
CT × CG × PG*	1.64	0.44	180.67	0.13	3.48	.042	.03

Note: * Degrees of freedom were corrected using the Greenhouse-Geisser estimates of sphericity.

Table SD4.

Mean ratings of the willingness to eat insect-based foods. Note: Values in parentheses are standard deviations.

	Celebrity gender		Participant gender		
Celebrity type	Male	Female	Male	Female	Total
Actor/actress	4.23 (1.09)	4.16 (1.12)	4.35 (1.20)	4.04 (1.77)	4.20 (1.07)
Musician	3.96 (1.17)	4.24 (1.13)	4.24 (1.26)	3.97 (1.86)	4.10 (1.12)
Athlete	4.10 (1.10)	4.14 (1.10)	4.37 (1.21)	3.87 (1.79)	4.12 (1.08)
Total	4.10 (1.08)	4.18 (1.07)	4.32 (1.20)	3.96 (1.08)	

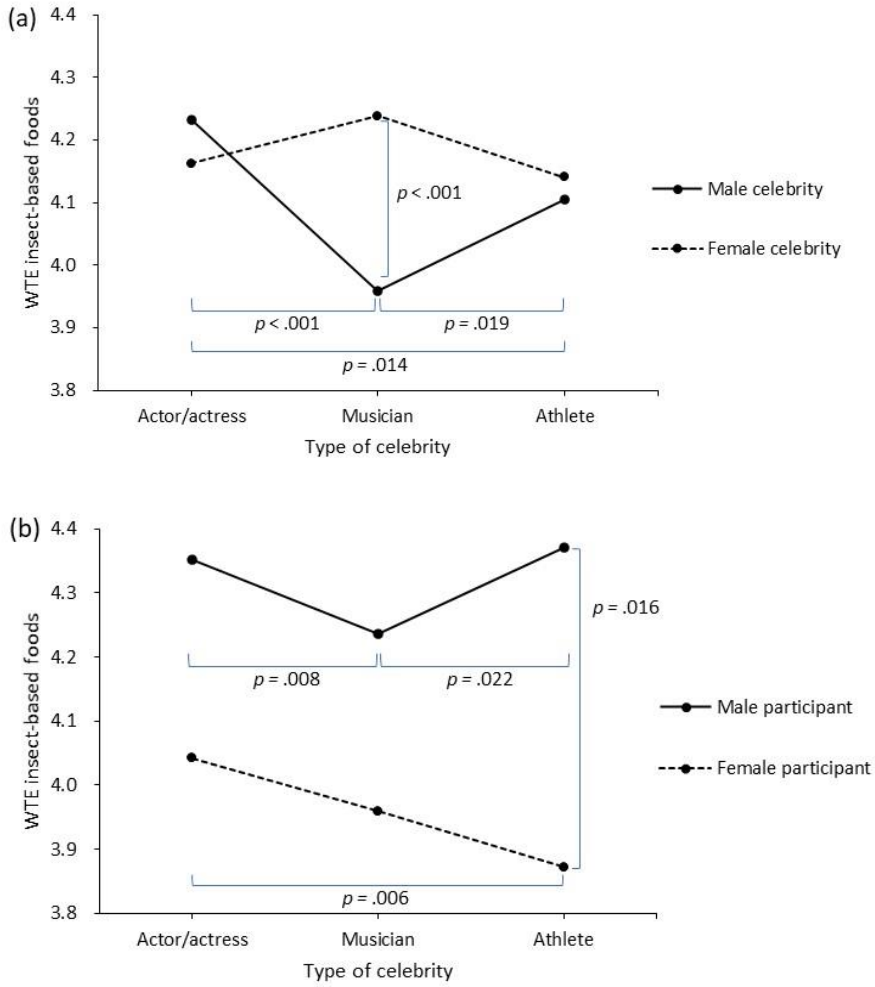

Fig. SD1.

The interaction between celebrity type and celebrity gender (a) and celebrity type and participant gender (b) on the willingness to eat (WTE) insect-based foods.