

PERSONALIZATION IN APPEALS TO REDUCE PLASTIC USE: CAN THE ADDED PSYCHOLOGICAL DISCOMFORT BENEFIT PLASTIC-SAVING INTENTIONS?

Abstract: Our experiment ($N = 275$) evaluates the impact of ad personalization by integrating participants' first name (or not) in an appeal to reduce plastic use on their behavioral intention. We consider psychological discomfort as a mediating process between ad personalization and the intention to reduce plastic use. Surprisingly, the results show that integrating someone's first name in the ad alleviates psychological discomfort. As expected, psychological discomfort, in turn, improves the intention to reduce plastic. Therefore, personalizing plastic-saving ads does not seem to be an effective way to encourage plastic-saving behaviors.

Keywords: Personalization; Plastic-saving; Psychological discomfort; Advertising; Cognitive dissonance theory.

LA PERSONNALISATION DES APPELS A REDUIRE L'UTILISATION DE PLASTIQUE : EST-CE QU'INCONFORT PSYCHOLOGIQUE ACCRU FAVORISE L'INTENTION DE REDUIRE LA CONSOMMATION DE PLASTIQUE ?

Résumé : Cette expérimentation ($N = 275$) évalue l'impact de la personnalisation d'une publicité en intégrant ou non le prénom des participants dans une publicité appelant à réduire l'utilisation de plastique sur leur intention comportementale. Nous avons considéré l'inconfort psychologique comme processus médiateur entre la personnalisation de la publicité et l'intention de réduire la consommation de plastique. Contrairement à notre hypothèse, les résultats montrent qu'intégrer le prénom d'une personne dans la publicité réduit l'inconfort psychologique. Comme attendu, l'inconfort psychologique, à son tour, augmente l'intention de réduire la consommation de plastique. Par conséquent, la personnalisation d'une publicité alertant sur la pollution plastique ne semble pas être un moyen efficace d'encourager des comportements de réduction de plastique.

Mots-clés : Personnalisation, Réduction du plastique, Inconfort psychologique, Publicité ; Théorie de la dissonance cognitive.

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Introduction

Plastic waste poses an increasing environmental concern, growing by more than 3% per year. The total mass reached an astonishing 396 million tons in 2016 and is expected to exceed 550 million tons in 2030 (WWF, 2019). To solve the planetary problem of plastic, consumers can (1) engage with government officials to ensure that they take steps to reduce, reuse, recycle and manage plastic waste in a transparent and accountable manner, (2) use their consumer power and encourage industries to show leadership by reducing their reliance on single-use and useless plastic, or, finally, (3) reduce their unnecessary plastic consumption, favor reuse and recycle. This research focuses on consumers' reduction of their single-use plastic consumption.

A survey of 6,000 consumers in 11 countries conducted by Accenture in 2019 found that 83% of respondents believe it is important or extremely important for companies to design products that are meant to be reused or recycled. Besides that, 72% of respondents said that they currently buy more environmentally friendly products than they did five years ago, and 81% said that they expect to buy more over the next five years. However, it is not easy for consumers to change their consumption habits. For instance, consumers need to be motivated, have a favorable attitude toward ecological behaviors, or locus of control to adopt these behaviors (Ertz, Huang, Jo, Karakas, & Sarigöllü, 2017). Thus, governments and non-governmental organizations need to find persuasive tactics for their plastic-saving advertising campaigns to improve consumers' plastic-saving behaviors (e.g., avoid the purchase of single-use products).

This research investigates if and how integrating recipients' first name in a plastic-saving ad increase their behavioral intention of plastic-saving. "Personalization refers to the incorporation of one or more recognizable individual characteristics (e.g., one's first name) in a persuasive text." (Dijkstra, 2008, p.765). Positive effects of personalization have been documented in other commercial settings. For instance, adding the name of the message recipient to the email's subject line increases the probability of the recipient opening it by 20%, which translates to an increase in sales' leads by 31% (Sahni, Wheeler, & Chintagunta, 2018). The superiority of a personalized ad over a standardized ad is more salient when recipients are highly involved with the focal subject of the ad than the lowly involved (Li & Liu, 2017). However, some other studies highlighted mixed results about the personalization effects along with reported adverse effects. For instance, personalization leads consumers to more elaborately process an ad, which stimulates both positive and negative thoughts about the ad (Maslowska, Smit, & van den Putte, 2016). People also tend to find personalized ads more intrusive (Authors, 2019). However, negative thoughts or perceived intrusiveness are likely to be reduced in a social marketing context because people may feel that personalization is more warranted than in commercial advertising. Thus, more research is needed on the effectiveness of personalization in "pro-environmental" advertising. Psychological discomfort has not previously been considered and that it is particularly relevant in this context in the sense that personalization could increase psychological discomfort, and that this feeling may lead to reduce plastic consumption. This research contributes to the theoretical understanding of personalized advertising in social marketing literature by uncovering a new working mechanism of ad personalization. This research also offers managerial contributions that will help policy makers in their prevention of reducing the impact of plastic pollution.

Conceptual background and hypotheses development

Many marketing research has focused on the fact that informing consumers about their consumption impact on the environment does not necessarily change their pro-environmental behaviors. Although the information on the negative consequences of their behaviors is advertised and consumers may have a positive attitude toward pro-environmental behaviors, their actual behaviors are hardly affected, which may appear contradictory to their attitudes (Nair, 2018).

Exposing consumers to an ad informing them about single-use plastic waste may or may not induce psychological discomfort. Indeed, people generally tend to see the environment as “someone else’s problem.” They could consider that it is the fault of government or industries, and “someone” should do something, but their own motivation is typically quite low. Indeed, consumers need to be motivated to adopt plastic-saving behaviors (Ertz et al., 2017). While consumers tend to blend into an anonymous mass, integrating personalization elements signals that the ad is directed explicitly at the individual (Dijkstra, 2008; Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008). Thus, when the ad is personalized, recipients are personally called out to take their responsibility; they can no longer hide in the masses and, thus, personalization may increase psychological discomfort.

Besides, consumers may feel powerless to tackle climate change. Everyone is familiar with using plastic, and our daily lives are highly dependent on the use of plastic (Syberg, Hansen, Christensen, & Khan, 2018). Based on the theory of planned behavior (Icek & Fishbein, 1980), Ertz et al. (2017) showed that perceived behavioral control plays a central role in determining intentions to reduce their consumption of single-use plastic products. However, personalization could increase the belief that they, as an individual, can make a difference and take concrete actions. When the ad is personalized, consumers may realize that they have more locus of control than they initially thought or that they did not make personally enough effort and, thus, experience psychological discomfort.

Finally, personalization is thought to increase the attention paid to the information in the ad (Hawkins et al., 2008). Eye-tracking experiments already demonstrated that including someone’s name increase visual attention to the ad and ad elements (Bang & Wojdyski, 2016; Authors, 2019). Thus, the careful reading of the ad could increase the psychological discomfort because deeper processing of the ad is more likely to strengthen these discomfort feelings. Indeed, personalization leads to deeper processing in the sense that the general ad information is linked to self-relevant existing memories of the self, including one’s experiences, values, and goals (Dijkstra, 2008). Accordingly, we propose the following hypothesis:

H₁: *Personalization of a plastic-saving advertisement increases psychological discomfort compared to a non-personalized ad.*

Festinger (1957, p. 3) proposed that “the existence of dissonance, being psychologically uncomfortable, will motivate the person to try to reduce the dissonance and achieve consonance.” Although the idea that cognitive dissonance creates an unpleasant feeling state is a central postulate of the theory, the feeling of psychological discomfort leads to an alteration in the attitudes, beliefs, or behaviors to reduce the discomfort. Thus, we expect that the psychological discomfort triggered by personalization would lead consumers to adjust their behaviors to reduce their feelings of discomfort. In this sense, the more consumers may experience psychological discomfort, the more they would adopt pro-environmental behaviors in line with the targeted behaviors depicted in the ad. Thus, we propose that:

H₂: *Psychological discomfort in response to a plastic-saving advertisement increases intentions of plastic-saving behaviors.*

Research methodology and results

Design and procedure. To test our hypotheses, we conducted an online between-subjects experiment in which we randomly exposed participants to one of two versions of a plastic-saving appeal, either personalized ($N = 132$) or not personalized ($N = 143$) (see Appendix A). As part of a class requirement, master students invited their relatives to participate in the experiment through a link containing the recipient's first name. The personalized ads embedded participants name retrieved from the survey URL. In the non-personalized advertisement, the participants' name was not included in the ads. The ads were otherwise identical between conditions. Both ads contained a banner with a catchphrase "[First name / or not], say no!". Under this banner, "Single-use plastic" was written in large print. Underneath was an infographic with illustrations of a plastic bag, a plastic bottle, a straw, and a plastic cup. Beside each of the illustrations, a key figure on their impacts on the environment was mentioned. After being exposed to the ad, participants completed the questionnaire.

Participants. In total, 275 participants were recruited with snow-ball sampling. Participants ranged in age from 18 to 67 years (56.7 % women; $M_{\text{age}} = 27.0$ years, $SD_{\text{age}} = 11.6$). Table 1 provides a more detailed sample description. The demographics of the sample did not differ significantly between conditions (Appendix B).

Measures. We measured all constructs through 7-point Likert scales (see Appendix C). Behavioral intentions ($M = 5.28$, $SD = 1.39$, $\alpha = 0.87$) were measured by asking participants how likely they were to adopt specific plastic-saving behaviors in the next weeks (6 items, e.g., refuse straws and plastic cutlery, buy less overpackaged products). Psychological discomfort ($M = 4.37$, $SD = 1.35$, $\alpha = 0.70$) was assessed with the scale from Harmon-Jones (2000). Finally, participants answered the question, "Did the advertisement contain your first name?" (0 = "No," 1 = "Yes") as a manipulation check.

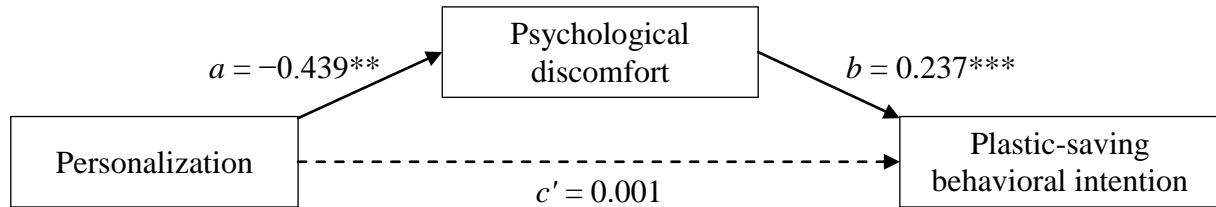
Manipulation check. A chi-square test of independence confirmed that participants were significantly more likely to recognize that the advertisement contained their name in the personalized condition than in the non-personalized condition ($\chi^2(1) = 189.48$, $p < 0.001$, Cramer's $V = 0.83$), indicating that our manipulation was successful.

Method of analysis. We analyzed the data using the PROCESS macro V3 for SPSS (model 4; Hayes, 2017) with 5,000 bootstrap samples and 95% confidence intervals. Personalization was entered as a dichotomous independent variable (0 = Non-personalized, 1 = Personalized), psychological discomfort as the continuous mediator, and plastic-saving behavioral intention as the continuous dependent variable. To check for ordinary least squares (OLS) regression underlying assumptions, regression residuals were screened for normality, linearity, independence, and homoscedasticity using procedures from Tabachnick and Fidell (2012). Because our data were heteroscedastic, we used the Huber-White heteroscedasticity-consistent standard error (HCSE) estimator of OLS parameter estimates in PROCESS.

Results. Contrary to our expectations, the results show that ad personalization negatively influences psychological discomfort ($b = -0.439$, $p < 0.01$, 95% CI = [-0.757; -0.121]), rejecting H1. Psychological discomfort, in turns, positively influences intention of plastic-saving behaviors ($b = 0.237$, $p < 0.001$, 95% CI = [0.095; 0.379]), accepting H2. The direct effect of personalization on plastic-saving behavioral intention is not significant ($b = 0.001$, $p = 0.996$, 95% CI = [-0.327; 0.329]), so the mediation is indirect-only. Finally, the index of mediation is negative and significant ($Index = -0.104$, 95% CI = [-0.224; -0.017]),

indicating that psychological discomfort is a mediating process between ad personalization and plastic-saving behavioral intention, even though the effect ad personalized does not impact psychological discomfort in the proposed direction. Figure 1 presents the results of our mediation test in the form of a statistical diagram.

Figure 1: Simple mediation model for ad personalization effect



Note: Dashed arrows mean non-significant relationships; ***: $p \leq 0.001$; **: $p \leq 0.01$; *: $p \leq 0.05$.

Because some items included in the plastic-saving behavioral intention scale are more closely related to the targeted behaviors in the ad than some others that are more general, we conducted complementary analyses on individual items of the plastic-saving behavioral intention scale. The results reveal that psychological discomfort more strongly influences and more significantly specific intentions, especially the intention to refuse straws and plastic cutlery behaviors (Appendix D).

Discussion

Summary of Results. By considering the integration of the consumers' first name in the ads, this research investigated if the personalization of a plastic-saving ad increases plastic-saving-behaviors. We hypothesized that personalization would induce psychological discomfort and, drawing on cognitive dissonance theory (Festinger, 1957), that psychological discomfort would lead consumers to improve their intentions of plastic-saving behaviors. Surprisingly, our results show that ad personalization decreases psychological discomfort. However, the feeling of discomfort increases the intention of plastic-saving behaviors.

Theoretical Implications. In line with the cognitive dissonance theory, our experiment shows that psychological discomfort increases consumers' intention of plastic-saving behaviors. Straws and plastic cutlery represent two of the four illustrations in the appeal, which could explain why psychological discomfort has a stronger impact on the item reflecting the intention of refuse straws and plastic cutlery. However, ad personalization does not work as expected. Theoretical explanations may explain why our research shows that integrating consumers' first names in appeals to reduce plastic use decreases their psychological discomfort.

A primary perspective is that personalization could detract consumers' attention away from the ad information, decreasing the self-referent encoding of the ad information. In this sense, consumers would pay less attention to plastic waste information presented in the ad. They may have directed their attention exclusively on their name, wondering why such personal information is embedded in the ad in an experimental context or because their name is located at the top of the ad. However, experimental eye-tracking studies do not seem to conclude the same. Indeed, when the ad is personalized, people do not only look more to the ad as a whole but also pay more visual attention to other elements contain in the ad (Bang & Wojdyski, 2016; Authors, 2019).

Another theoretical possibility would be that consumers are mostly aware of single-use plastic waste and believe that they contribute enough to the reduction of pollution through their consumption. Could it be that, if the ad uses consumers' names, they feel like they are

targeted because they are already doing well? Consumers may believe they are the target audience to appeals to reduce plastic use because publishers (e.g., governments and non-governmental organizations) would consider them as susceptible to make more effort because they are already making pro-environmental efforts. In this sense, this belief would decrease their psychological discomfort and motivation to use less plastic.

Personalization is supposed to cause more self-referencing (Dijkstra, 2008); thus, consumers are likely to compare their own behaviors to those illustrated in the ad, including the key figures reported in the ad. The numbers may seem high. If consumers believe that they are performing better, at least on one of these four points, they are likely to come out on top and make a downward social comparison. Therefore, there would be less need for them to make more efforts and feel psychological discomfort.

Managerial Implications. From a managerial perspective, this research could benefit to governments and non-governmental organizations aiming to encourage consumers to adopt plastic-saving behaviors. Since our research shows that integrating consumers' first name in a plastic-saving ad decrease psychological discomfort, it is therefore not advisable to personalize such advertising campaigns. Managers would need to find other ways to increase the feeling of discomfort in order to improve consumers' intention of plastic-saving behaviors. At this stage of the research, our results should be taken with caution. If personalization increases self-referencing and consumers' may make a social comparison, maybe it could be advisable to design appeals in other ways. More research is need.

Limitations and avenues for further research. The limitations mainly steam from the experimental design of this research. First, we used limited measurement scales, and thus, we are not able to uncover why personalization decreases the feeling of discomfort. Further research could investigate the mediating role of self-referencing or test whether ecological consciousness could moderate the influence of ad personalization on psychological discomfort—maybe only the less ecological conscious consumers would experience discomfort after being exposed to plastic-saving ads. Second, we did not measure visual attention to the ad (as a whole) and specific information in the ad (e.g., participants' first name, textual information about plastic waste, or visual illustration about plastic waste). Eye-tracking experiments could measure visual attention to the same stimuli to uncover whether personalization increases the processing of the ad information or whether personalization detracts attention away from ad information. Third, consumers' first names were retrieved from participants' URL to the online survey in order to be embedded in the ads. Thus, if participants saw their names in the online survey URL, they could devote more cognitive effort on how personalization occurred from a technical standpoint (e.g., "how this survey can exactly know and embed my name in the ad?"), detracting away they attention to the information about plastic waste and drawing their attention on the execution of personalization. This limitation is not discussed in previous research and could significantly impact the personalization effect in research with experimental design. Further research could, therefore, ask participants whether they saw their name in the URL, use technological methods for participants not to see such information, or ask participants about the purpose of the study. Fourth, psychological discomfort is different from cognitive dissonance, and the measure is general. It could be that people mean they feel bothered about plastic pollution, and the measure could reflect some attention effect or self-referent thinking, because if they paid more attention to the ad or spent more time processing, they might find what is described, with the huge numbers cited, bothersome. This research fails to determine that participants felt "bothered" or experience "discomfort" with their own attitude-intention gap. Finally, further research could test another appeal with more upward social comparison and

try to see the reserve results or measure current pro-environmental behaviors (in general, or related to plastic use in particular) and test for the moderation effects.

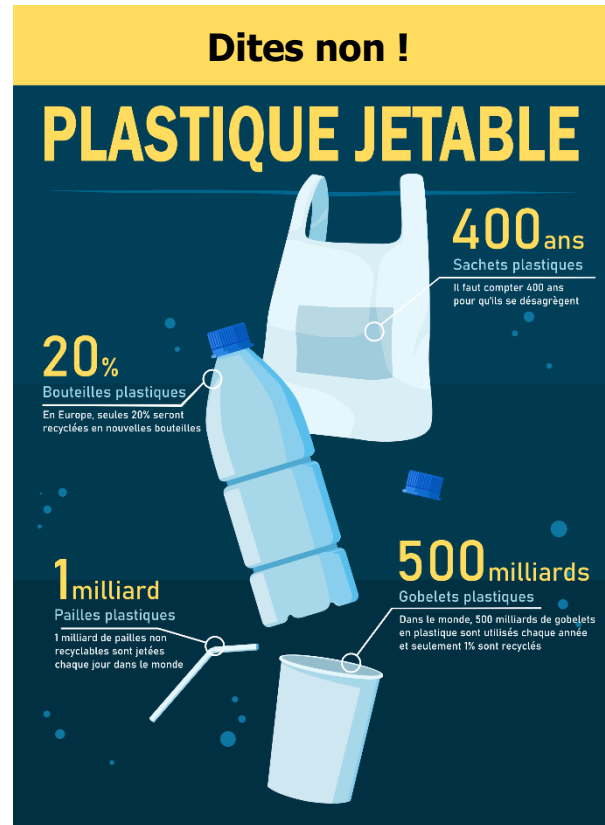
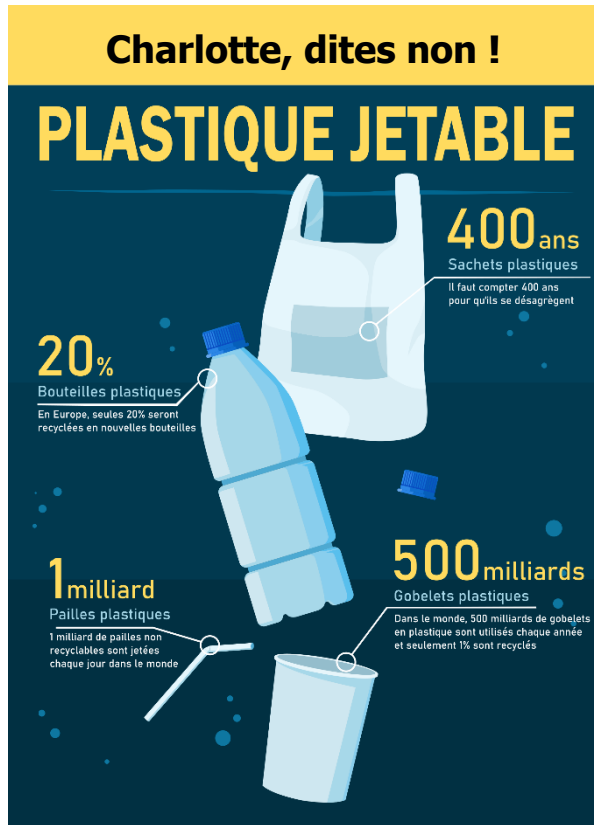
References

- Accenture (2019). Accenture chemicals global consumer sustainability survey 2019. Retrieved from: <https://newsroom.accenture.com/news/more-than-half-of-consumers-would-pay-more-for-sustainable-products-designed-to-be-reused-or-recycled-accenture-survey-finds.htm>
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs: Prentice-Hall.
- Bang, H., & Wojdyski, B. W. (2016). Tracking users' visual attention and responses to personalized advertising based on task cognitive demand. *Computers in Human Behavior*, *55*, 867–876.
- Dijkstra, A. (2008). The psychology of tailoring-ingredients in computer-tailored persuasion. *Social and Personality Psychology Compass*, *2*(2), 765–784.
- Ertz, M., Huang, R., Jo, M-S., Karakas, F., & Sarigöllü, E. (2017). From single-use to multi-use: Study of consumers' behavior toward consumption of reusable containers. *Journal of Environmental Management*, *193*, 334–344.
- Harmon-Jones, E. (2000). Cognitive Dissonance and Experienced Negative Affect: Evidence that Dissonance Increases Experienced Negative Affect Even in the Absence of Aversive Consequences. *Personality and Social Psychology Bulletin*, *26*(12), 1490–1501.
- Hawkins, R. P., Kreuter, M., Resnicow, K., Fishbein, M. & Dijkstra, A. (2008). Understanding tailoring in communicating about health. *Health Education Research*, *23*(3), 454–466.
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis, second edition: A regression-based approach*. New York, NY: Guilford Publications.
- Li, C., & Liu, J. (2017). A name alone is not enough: A reexamination of web-based personalization effect. *Computers in Human Behavior*, *72*, 132–139.
- Maslowska, E., Smit, E. G., & van den Putte, B. (2016). It is all in the name: A study of consumers' responses to personalized communication. *Journal of Interactive Advertising*, *16*(1), 74–85.
- Nair, S. (2018). Impact of plastic ban on consumer behavior towards bisleri. *Reflections-Journal of Management*, *1*(1), 1–11.
- Sahni, N. S., Wheeler, S. C., & Chintagunta, P. (2008). Personalization in email marketing: The role of noninformative advertising content. *Marketing Science*, *37*(2), 236–258.
- Syberg, K., Hansen, S. F., Christensen, T. B., & Khan, F. R. (2018). Risk perception of plastic pollution: Importance of stakeholder involvement and citizen science. In Wagner, E., & Lambert, S. (Eds). *Freshwater Microplastics* (pp. 203–221). Cham: Springer.
- Tabachnick, B. G., & Fidell, L. S. (2012). *Using multivariate statistics* (6th ed.). Boston: Pearson.
- WWF (2019). Pollution plastique : À qui la faute ? Identification des défaillances systémiques et présentation du scénario zéro plastique dans la nature en 2030. Retrieved from: http://www.datapressepremium.com/rmdiff/2005445/SOUS_EMBARGO_WWF_Rapport_plastiques_FR.pdf

Appendix A: Stimuli (in French)

(a) Personalized

(b) Not personalized



Appendix B: Demographic information about participants

| | | Non-personalized condition | | Personalized condition | | Chi-square test |
|-----------------|---------------------|----------------------------|-------|------------------------|-------|-------------------------|
| | | <i>n</i> | % | <i>n</i> | % | |
| Gender | Female | 74 | 51.7% | 82 | 62.1% | $\chi^2(1) = 3.01$ (ns) |
| | Male | 69 | 48.3% | 50 | 37.9% | |
| Age | 18 – 21 | 65 | 45.5% | 60 | 45.5% | $\chi^2(2) = 0.25$ (ns) |
| | 22 – 24 | 38 | 26.6% | 38 | 28.8% | |
| | ≥ 25 | 40 | 28.0% | 34 | 25.8% | |
| Education level | High school | 23 | 16.1% | 20 | 15.2% | $\chi^2(3) = 5.70$ (ns) |
| | Associate Degree | 16 | 11.2% | 22 | 16.7% | |
| | Bachelor's degree | 44 | 30.8% | 51 | 38.6% | |
| | Master's degree | 60 | 42.0% | 39 | 29.5% | |
| Income | < 10 000 € | 99 | 69.2% | 91 | 68.9% | $\chi^2(2) = 0.36$ (ns) |
| | 10 000 € – 29 999 € | 24 | 16.8% | 25 | 18.9% | |
| | ≥ 30 000 € | 20 | 14.0% | 16 | 12.1% | |
| City population | < 100 000 citizens | 45 | 31.5% | 51 | 38.6% | $\chi^2(1) = 1.55$ (ns) |
| | > 100 000 citizens | 98 | 68.5% | 81 | 61.4% | |
| TOTAL | | 143 | 100% | 132 | 100% | |

Appendix C: Constructs, items, and scale sources

| Items | Factor loading |
|---|----------------|
| Psychological discomfort ($\alpha = 0.70$) (Harmon-Jones, 2000) | |
| When I saw the advertisement, I felt... | |
| • Uncomfortable | 0.85 |
| • Uneasy | 0.84 |
| • Bothered | 0.67 |
| Plastic-saving behavioral intention ($\alpha = 0.87$) | |
| How likely are you to adopt these behaviors in the next weeks? | |
| • Refuse straws and plastic cutlery | 0.70 |
| • Buy fewer overpackaged products | 0.80 |
| • Buy fewer plastic bottles | 0.80 |
| • Use a gourd more often | 0.77 |
| • Avoid the purchase of a single-use product | 0.82 |
| • Privilege other materials than plastic | 0.81 |

Appendix D: Effects of psychological discomfort on specific plastic-saving behavioral intentions

| Items | Coef. | <i>p</i> | LLCI | ULCI |
|--|-------|----------|-------|-------|
| Refuse straws and plastic cutlery | 0.348 | < 0.001 | 0.173 | 0.523 |
| Buy fewer overpackaged products | 0.225 | < 0.01 | 0.062 | 0.388 |
| Buy fewer plastic bottles | 0.221 | < 0.05 | 0.036 | 0.405 |
| Use a gourd more often | 0.201 | < 0.05 | 0.009 | 0.394 |
| Avoid the purchase of a single-use product | 0.216 | < 0.01 | 0.057 | 0.375 |
| Privilege other materials than plastic | 0.212 | < 0.01 | 0.060 | 0.364 |