

Burghartz, Pia

**Article**

## Robo Homecoming: Customization to Curb Uniqueness Threat

Marketing Review St.Gallen

**Provided in Cooperation with:**

Universität St. Gallen, Institut für Marketing und Customer Insight

*Suggested Citation:* Burghartz, Pia (2021) : Robo Homecoming: Customization to Curb Uniqueness Threat, Marketing Review St.Gallen, ISSN 1865-7516, Thexis Verlag, St.Gallen, Vol. 38, Iss. 2, pp. 54-61

This Version is available at:

<https://hdl.handle.net/10419/276136>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Marketing Review St. Gallen



2 | 2021 **SCHWERPUNKT** Wirksamkeit von Markenkommunikation • A Contemporary Approach to Holistic Brand Communication • Employer-Branding • Brand-Consumer Relationships • Dialogs in Advertising • „Sentiment“-Kommunikation der Deutschen Telekom **SPEKTRUM** Robo Homecoming: Customization to Curb Uniqueness Threat • Die rechtliche Seite des Marketingmanagements

[www.marketing-review.ch](http://www.marketing-review.ch)

Die neue Welt der  
Markenkommunikation

# Robo Homecoming: Customization to Curb Uniqueness Threat

---

Firms are increasingly offering autonomous domestic products (ADPs), but consumers often resist adoption. This paper suggests that when consumers feel threatened in their sense of uniqueness, they may reject ADPs. Compelling experimental evidence shows that this is the case, and that rejection may be counteracted by customization.

**Pia Burghartz**

In recent years, autonomous products have been increasingly making their way into consumers' homes (Etherington, 2020; Hoffmann & Nowak, 2018). Autonomous domestic products (ADPs) are one major trend in this area and expected to become a US\$ 9.1 billion market with a growth rate of 22.4% by 2024 (Markets and Markets, 2019). Consequently, companies are making significant investments in developing such products (Prassler et al., 2016). ADPs are automating many household tasks, including ones that consumers traditionally have had to perform themselves (e.g., lawn mowing, vacuum cleaning, cooking, and taking care of family members; Leung, Poalacci, & Puntoni, 2018; Marr, 2019, 2020). Recent examples include the lawn mower Tango (Deere & Co, Moline, USA), the vacuum cleaner Roomba (iRobot, Bedford, USA), the cooking processor Thermomix (Vorwerk (a), Wuppertal, Germany), and the social companion Buddy (Blue Frog Robotics, Paris, France).

The predicted breakthrough of ADPs is based on the premise that consumers adopt such products. To date, research on how they are perceived by consumers is scant (Leung et al., 2018; Schmitt, 2019). Yet, consumers are the ultimate users and determine adoption likelihood and success (Longoni, Bonnezzi, & Morewedge, 2019). Therefore, companies need to better understand consumer expectations (de Graaf & Allouch, 2013; Young et al., 2009). It appears likely that consumers perceive ADPs positively: automation promises a future in which devices will perform boring, repetitive chores (e.g., vacuum cleaning, lawn mowing), thus freeing up valuable time and energy for their owners (Leung et al., 2018; Marr, 2020). While this development would seem favorable, several reasons for resisting autonomous products have been identified in the marketing literature (de Bellis & Johar, 2020; Wertenbroch, 2019).

Building on this literature, this paper hypothesizes that ADPs may trigger a perceived 'uniqueness threat' in consumers. It further suggests that one way of counteracting this threat is customization. If customization curbed this threat, this would represent an extraordinary opportunity for firms to allow consumers to design ADPs so that devices take into account their unique needs and preferences. Thus, based on research into autonomous products (Rijsdijk & Hultink, 2003), the need for uniqueness (Snyder & Fromkin, 1980), and customization (Arora et al., 2008), this paper proposes that customizing ADPs curbs uniqueness threat and in turn improves consumers' valuation of these products.

### **Pia Burghartz**

PhD Candidate and Research Associate, Institute for Customer Insight, University of St. Gallen, St. Gallen, Switzerland

Tel.: +41 (0) 78 7498914  
pia.burghartz@unisg.ch

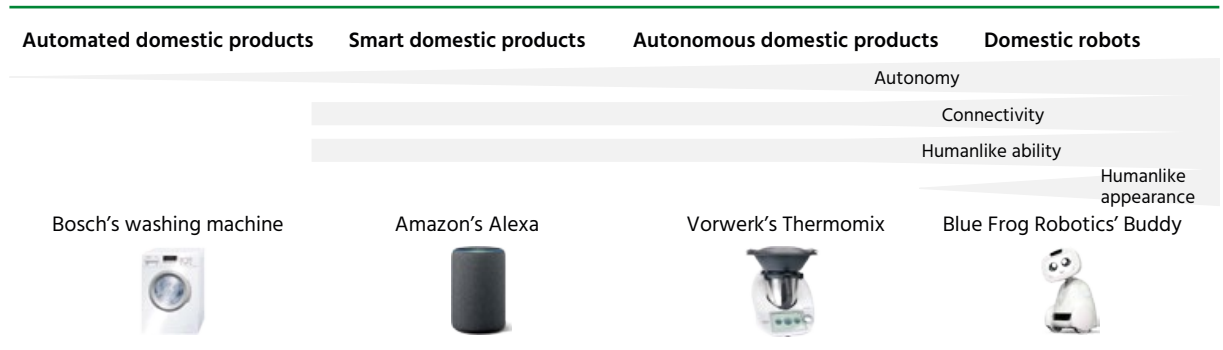
## **Theoretical Background**

### **Autonomous Domestic Products (ADPs)**

Consumers are increasingly interacting with domestic products that are automated to perform tasks ordinarily performed by humans (Wertenbroch, 2019). While automated domestic products have existed for some time (e.g., washing machines), they have only recently begun to be equipped with intelligence and higher levels of autonomy (de Bellis & Johar, 2020; Porter & Heppelmann, 2014). Depending on the level of autonomy, these products can be referred to as smart products (e.g., Alexa; Amazon, Seattle, USA), autonomous products (e.g., Thermomix; Vorwerk (a), Wuppertal, Germany), or robots (e.g., Buddy; Blue Frog Robotics, Paris, France). While smart products usually require human input to function, autonomous products may require initial human input but then work fully autonomously (de Bellis & Johar, 2020; Schweitzer & van den Hende, 2016). Robots often exhibit even higher degrees of autonomy than autonomous products. Further, they can be distinguished from autonomous products by their humanlike abilities (e.g., speech and movement) and/or appearance (e.g., face and arms; Mende et al., 2019; Young et al., 2009). Figure 1 shows the similarities and differences between automated products, smart products, autonomous products, and robots in the domestic field.

This paper focuses on the autonomy of such products. It therefore examines ADPs and domestic robots as both types of products demonstrate higher levels of autonomy. It consistently uses the term ADP, which also comprises domestic robots. ADPs are characterized by the delegation of manual domestic tasks to technology (de Bellis & Johar, 2020). Such devices do not require human intervention and operate independently and purposefully to perform manual household tasks (Beer, Fisk, & Rogers, 2014; Rijsdijk & Hultink, 2003, 2009). ADPs are increasingly based on artificial intelligence (AI), which improves performance

**Fig. 1: Similarities and Differences Between Categories of Domestic Products**



Sources: Amazon; Blue Frog Robotics; Bosch; Vorwerk (a).

through learning algorithms (Porter & Heppelmann, 2014). For example, iRobot's Roomba, when placed in a building, cleans the floors all by itself. Its programmed algorithms enable Roomba to progressively learn how to clean the floors as effectively and efficiently as possible.

### Uniqueness Threat as a Barrier to Adoption

ADPs are designed to free consumers from the tyranny of household chores and enable them to spend time on other activities (Puntoni, 2018; Young et al., 2009). Typical chores include lawn mowing, vacuum cleaning, wiping, ironing, cooking, and taking care of family members (de Bellis & Johar, 2020; Wertenbroch, 2019). Despite its clear advantages, task automation might not be universally desirable (Luo et al., 2019; Puntoni, 2018). This might be due to consumers' perceived infringement of their sense of uniqueness, which is potentially caused by how ADPs operate.

Such products are programmed to work in a standardized manner and often do not take into account consumers' individuality (de Bellis & Johar, 2020; Haslam, 2006). Individuality relates to consumers' inherent need to perceive and portray themselves as distinct from others (Snyder & Fromkin, 1980; Tian, Bearden, & Hunter, 2001). This need is particularly strong for individualistic Western (vs. collectivistic Eastern) cultures (Kim & Drolet, 2003). New technologies might impair this need for individuality as they increasingly move towards mass individualization, which is rather homogenizing. For example, Facebook profiles should in theory represent what is unique about our lives, yet the technology behind Facebook strips us of all but the most superficial expressions of individuality (e.g., which particular beach photo we select as our background image; Wu, 2018). Similarly,

consumers fear that autonomous products may create indistinguishable users who think and behave similarly by universally applying the same algorithms and neglecting their peculiarities (Schweitzer, Gollnhofer, & de Bellis, 2019). This becomes apparent in negative attitudes toward ADPs.

For example, evidence shows that consumers' rejection of AI in the medical field is driven by a perceived 'uniqueness neglect', that is, the concern that algorithms are less able than humans to take their unique characteristics into account (Longoni et al., 2019). Drawing on this literature, this paper explores the psychological consequences of consumers feeling that their uniqueness is not sufficiently taken into account by ADPs. It is argued that consumers' valuation of ADPs is impaired by feeling that their sense of uniqueness is threatened, that is, the perception of a so-called 'uniqueness threat'.

Hypothesis 1: Consumers' valuation of ADPs is driven by a perceived uniqueness threat.

### Customization to Curb Uniqueness Threat

So how can the uniqueness threat be curbed so that consumers adopt ADPs? Exploring ways of mitigating resistance to these products has been defined as an important area of future research (Davenport et al., 2020; Longoni et al., 2019). One means of counteracting resistance would be to enable customization (Arora et al., 2008; Olsen & Pracejus, 2020). Customization allows consumers to adapt ADPs to their unique needs and preferences (Dellaert & Stremersch, 2005; von Hippel & Katz, 2002). One way of customizing ADPs would be to give consumers control over the algorithms underlying the product by enabling slight modifications (Dietvorst, Simmons, & Massey, 2015, 2018). Research has shown that allowing consumers to influence algorithms increases adoption

rates (Davenport et al., 2020; Niemelä et al., 2019). Initial qualitative evidence suggests that customizing the appearance of ADPs also facilitates a positive product experience (Sung, Grinter, & Christensen, 2009). Customization enables consumers to modify ADPs and thus to create a product that is uniquely tailored to them (Burghartz et al., 2020; Franke & Schreier, 2008). On this basis, this paper argues that customization curbs consumers' perception of a uniqueness threat.

Hypothesis 2: ADP customization attenuates consumers' perceived uniqueness threat.

## Experimental Study

The following experiment examines whether the negative effect of autonomy on consumers' product valuation (conceptualized as product liking) is caused by a perceived uniqueness threat (hypothesis 1). It also examines whether customization attenuates this threat (hypothesis 2). A controlled experiment was conducted using an autonomous cooking appliance.

### Participants and Procedures

The sample included 233 students from a European business school (mean age = 23.3 years; 46% female). Participants received an online questionnaire including a scenario and were randomly assigned to one of three experimental groups in a between-subjects design (i.e., each participant was shown one of three cooking appliances; see figure 2).

Those in the autonomous customized group 1 were shown a picture of an autonomous cooking appliance. They were asked to imagine that they had just decided to buy this ADP

called Multimix manufactured by TÖSLI (the product and brand names were fictitious). Participants had to read a product description highlighting that the Multimix was autonomous and would do the cooking by itself. Further, the description mentioned the Multimix components (e.g., pans, bowl, nylon tools), the cooking tasks that could be performed (e.g., chopping, sautéing, weighing), and the meals that could be prepared (e.g., sauce, soup, pasta). Lastly, the participants were informed that they could customize the Multimix using a digital cookbook with customized recipes (see figure 2A). They were asked to indicate their (1) cooking habits (e.g., how much time they usually spend preparing a meal, what ingredients they use), (2) eating habits (e.g., to what extent they eat vegetables and meat, or whether they like European or Asian food), and (3) household information (i.e., how many people they usually cook for).

In the autonomous non-customized group 2, participants got to read the same product description as in group 1. However, they were not offered the option to customize the Multimix but were told that the device came with a manual cookbook including popular everyday recipes (i.e., non-customized recipes; see figure 2B).

In the non-autonomous non-customized group 3, participants were shown a picture of a manual cooking appliance. They were asked to imagine that they had just decided to buy TÖSLI's Multimix. The product description highlighted that the device was non-autonomous and only assisted cooking. Similarly to the previous groups, the description also mentioned the Multimix components, the cooking tasks that could be performed, and the meals that could be prepared. As in the autonomous non-customized group, participants were told that the Multimix came with a manual cookbook (see figure 2C).

## Management Summary

Given that autonomous domestic products (ADPs) often lack consumer acceptance, this paper investigates why acceptance rates are low and shows how this might be counteracted. It hypothesizes that consumers' low valuation of ADPs is due to a perceived threat to their sense of uniqueness (i.e., 'uniqueness threat'). While experimental evidence compellingly supports this hypothesis, it also shows that this effect is attenuated when consumers can customize such products. These findings have direct managerial implications.

## Main Propositions

1. Depending on their level of autonomy, connected domestic products may be categorized as either smart products, autonomous products, or robots.
2. Despite clear advantages, consumers often tend to reject autonomous domestic products (ADPs).
3. Consumers' valuation of ADPs is driven by a perceived uniqueness threat.
4. Consumers' perceived uniqueness threat is attenuated by the customization of ADPs.

**Fig. 2: Overview of the Three Experimental Groups**

<b>A. Autonomous customized Group 1</b>	<b>B. Autonomous non-customized Group 2</b>	<b>C. Non-autonomous non-customized Group 3</b>
Autonomous 	Autonomous 	Non-autonomous 
Customized 	Non-customized 	Non-customized 

Sources: AppAdvice; Techstudio; Vorwerk (a, b).

After having been presented with one of the three experimental groups, the participants were asked to respond to two checks to ensure that the manipulation—making the cooking appliance appear autonomous and customizable—was successful. Hence, the checks measured the participants’ perception of the device’s autonomy and customizability. Next, participants were asked to indicate to what extent they felt that the cooking appliance threatened their sense of uniqueness. Further, they were asked to indicate to what degree they liked the presented product. Finally, participants had to respond to questions about various control variables—perceived realism, brand attitude, age, gender, and language proficiency—that might unintentionally affect consumers’ product liking. Perceived realism was controlled for to ensure that the participants’ perception of the scenario did not affect the results. Brand attitude served as a control variable to ensure that the image of, and emotional attachment to, the focal brand did not drive the results. Age and gender were controlled for to ensure that demographics did not affect the results. Language proficiency was also controlled for to ensure that the participants’ English skills did not influence the results.

**Measurement Procedures**

Product liking was assessed with a three-item seven-point scale (“I perceive the Multimix extremely negative/positive,” “The Multimix is extremely unfavorable/favorable,” “I dislike/like the Multimix a great deal”;  $\alpha = .90$ , indicating high reliability) taken from Leung et al. (2018). Uniqueness threat was assessed with a one-item (“Cooking with the Multimix makes me feel less unique”) Likert scale (i.e., a seven-

point scale with the scale ends “strongly disagree/strongly agree”) adapted from White and Argo (2011).

A series of five variables served as control variables in the analyses: (1) perceived realism, assessed with a three-item Likert scale (“The situation of buying the Multimix seemed real to me,” “I could picture myself buying the Multimix,” “In the situation, I could imagine trying out the Multimix”;  $\alpha = .84$ , indicating high reliability), (2) brand attitude, assessed with a one-item Likert scale each (“I like the brand Thermomix/Rösle”) adapted from Sengupta and Johar (2002), (3), age (4) gender, and (5) language proficiency. The differences in the means of the control variables between the groups were not significant indicating that the random assignment of participants to the groups was successful.

**Lessons Learned**

1. Companies need to better understand consumers’ attitudes toward autonomous domestic products (ADPs).
2. Manufacturers of ADPs should anticipate consumers’ perceived threat to their sense of uniqueness (i.e., ‘uniqueness threat’) as a potential barrier to adoption.
3. Companies should offer consumers the opportunity to customize ADP functionality to their unique needs and preferences to curb the uniqueness threat.

The manipulation checks regarding perceived product autonomy and customizability were both assessed with a one-item Likert scale (“It felt like the Multimix was autonomous/customized”). The differences in means between the groups were highly significant ( $p < .001$ ), indicating that the experimental manipulations—making the product seem autonomous and customizable—were successful.

### Results

As predicted, the findings indicated that product liking was not significantly different across all but between some of the groups (see figure 3). An analysis of covariance (ANCOVA; cooking appliance type as the independent variable, product liking as the dependent variable, and perceived realism, brand attitude, age, gender, and language proficiency as control variables) showed a non-significant effect of cooking appliance type on product liking (group 1: mean ( $M$ )<sub>autonomous\_customized</sub> = 4.60, standard deviation (SD) = 1.29; group 2:  $M$ <sub>autonomous\_non-customized</sub> = 4.21, SD = 1.46; group 3:  $M$ <sub>non-autonomous\_non-customized</sub> = 4.59, SD = 1.18;  $F(1, 225) = .01, p = .933$ ). An analysis of variance (ANOVA; without taking any control variables into account) also produced a non-significant effect ( $p = .940$ ).

However, planned contrasts showed a significant difference in product liking between group 3 ( $M$ <sub>non-autonomous\_non-customized</sub> = 4.59) and group 2 ( $M$ <sub>autonomous\_non-customized</sub> = 4.21), corresponding to a decrease in product liking for the autonomous (vs. non-autonomous) group of 0.38 or 9% ( $F(1, 149) = 4.53, p = .035$ ). Planned contrasts further revealed a significant difference in product liking between group 2 ( $M$ <sub>autonomous\_non-customized</sub> = 4.21) and group 1 ( $M$ <sub>autonomous\_customized</sub> = 4.60), corresponding to an increase in product liking for the customized (vs. non-customized) group of 0.39 or 9% ( $F(1, 146) = 4.60, p = .034$ ). As predicted, such an effect was not found between group 1 ( $M$ <sub>autonomous\_customized</sub> = 4.60) and group 3 ( $M$ <sub>non-autonomous\_non-customized</sub> = 4.59;  $F(1, 147) = .00, p = .951$ ).

Additionally, a mediation analysis—that is, an analysis to explain the process that underlies the relationship between the independent and dependent variable via a third mediator variable—was conducted (Hayes, 2013). In the present case, uniqueness threat was proposed to be the mediator that explained the relationship between the independent (i.e., cooking appliance type: autonomous customized, autonomous non-customized, non-autonomous non-customized) and the dependent variable (i.e., product liking).

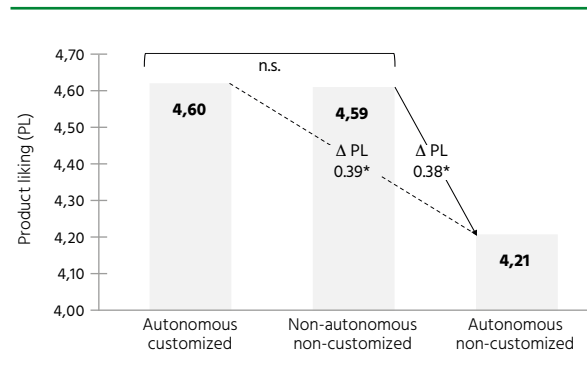
Two mediation analyses were conducted to test whether the relationship between cooking appliance type and product liking could be explained by the uniqueness threat. The re-

sults indicate that the mediation was significant, that is, that cooking appliance type indirectly influenced product liking through the uniqueness threat. The effect between the autonomous and non-autonomous groups (autonomous (non-)customized vs. non-autonomous non-customized) on product liking was positive and significant ( $a = 1.59, p < .001$ ); in support of the indirect effect ( $ab < -.03$ ), the bias-corrected 95% confidence interval based on 10,000 bootstrapped samples excluded 0 ( $[-.06, -.01]$ ; see figure 4A). These results provide support for hypothesis 1 that a reason for consumers’ decreased valuation of ADPs is the perceived uniqueness threat. The effect between the customized and non-customized groups (autonomous customized vs. (non-)autonomous non-customized) on product liking was negative and significant ( $a = -.67, p = .017$ ); in support of the indirect effect ( $ab = .013$ ), the bias-corrected 95% confidence interval based on 10,000 bootstrapped samples excluded 0 ( $[.00, .03]$ ; see figure 4B). These results provide support for hypothesis 2 that ADP customization curbs consumers’ perceived uniqueness threat.

### Discussion

The experimental findings provide evidence (in a controlled setting) that the proposed negative effect of autonomy on consumers’ product valuation may be explained by uniqueness threat and curbed through customization. They suggest that autonomy significantly decreases product valuation (by 9%) and that this is due to consumers’ perceived uniqueness threat. Moreover, the findings show that customization attenuates this threat (by 9%). Overall, the results imply that providers of autonomous products should be aware of consu-

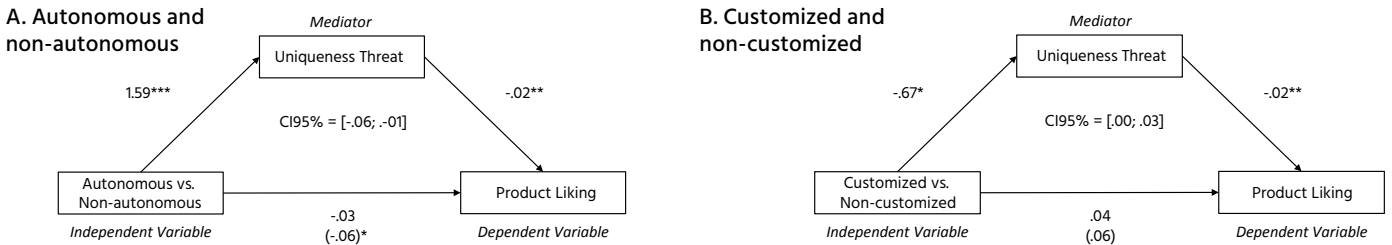
**Fig. 3: The Effect of Cooking Appliance Type on Product Liking**



\* $p < .05$ ; Source: Own illustration.



**Fig. 4: Mediation via Uniqueness Threat**



NOTE: The path coefficients are unstandardized regression coefficients. The value in parentheses indicates the total effect of cooking appliance type on product liking: \*p < .05; \*\*p < .01; \*\*\*p < .001.

Source: Own illustration.

## Literature

Arora, N., Dreze, X., Ghose, A., Hess, J. D., Iyengar, R., Jing, B., Joshi, Y., Kumar, V., Lurie, N., Neslin, S., Sajeesh, S., Su, M., Syam, N., Thomas, J., & Zhang, Z. J. (2008). Putting One-to-One Marketing to Work: Personalization, Customization, and Choice. *Marketing Letters*, 19(305), 305–21. <https://doi.org/10.1007/s11002-008-9056-z>

Beer, J. M., Fisk, A., & Rogers, W. A. (2014). Toward a Framework for Levels of Robot Autonomy in Human-Robot Interaction. *Journal of Human-Robot Interaction*, 3(2), 75–99. <https://doi.org/10.5898/JHRI.3.2.Beer>

Burghartz, P., de Bellis, E., Krause, F., Franke, N., Klanner, I., & Häubl, G. (2020). Innovating Mass Customization with Strict Uniqueness. *Proceedings of the European Marketing Academy*, 49th, 63047.

Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How Artificial Intelligence will Change the Future of Marketing. *Journal of the Academy of Marketing Science*, 48(1), 24–42. <https://doi.org/10.1007/s11747-019-00696-0>

de Bellis, E. & Johar, G. (2020). Autonomous Shopping Systems: Identifying and Overcoming Barriers to Consumer Adoption. *Journal of Retailing*, 96(1), 74–87. <https://doi.org/10.1016/j.jretai.2019.12.004>

de Graaf, M. M. A. & Allouch, S. B. (2013). Exploring Influencing Variables for the Acceptance of Social Robots. *Robotics and Autonomous Systems*, 61(12), 1476–86. <https://doi.org/10.1016/j.robot.2013.07.007>

Dellaert, B. G. C. & Stremersch, S. (2005). Marketing Mass-Customized Products: Striking a Balance Between Utility and Complexity. *Journal of Marketing Research*, 42(2), 219–27. <https://doi.org/10.1509/jmkr.42.2.219.62293>

Dietvorst, B. J., Simmons, J. P., & Massey, C. (2015). Algorithm Aversion: People Erroneously Avoid Algorithms After Seeing Them Err. *Journal of Experimental Psychology: General*, 143(6), 1–13. <http://doi.org/10.1037/xge0000033>

Dietvorst, B. J., Simmons, J. P., & Massey, C. (2018). Overcoming Algorithm Aversion: People Will Use Imperfect Algorithms If They Can (Even Slightly) Modify Them. *Management Science*, 64(3), 1155–70. <https://doi.org/10.1287/mnsc.2016.2643>

Etherington, D. (2020, January 14). The Robot Homecoming is Upon Us. *TechCrunch*. <https://techcrunch.com/2020/01/14/the-robot-homecoming-is-upon-us/>

Franke, N. & Schreier, M. (2008). Product Uniqueness as a Driver of Customer Utility in Mass Customization. *Marketing Letters*, 19(2), 93–107. <https://doi.org/10.1007/s11002-007-9029-7>

Haslam, N. (2006). Dehumanization: An Integrative Review. *Personality and Social Psychology Review*, 10(3), 252–64. <https://doi.org/10.1111/jedm.12050>

Hayes, A. F. (2013). *Methodology in the Social Sciences. Introduction to Mediation, Moderation, and Conditional Process Analysis. A Regression-Based Approach*. Guilford Press. <https://doi.org/10.1111/jedm.12050>

Hoffmann, D. L. & Nowak, T. P. (2018). Consumer and Object Experience in the Internet of Things: An Assemblage Theory Approach. *Journal of Consumer Research*, 44(6), 1178–1204. <https://doi.org/10.1093/jcr/ucx105>

Kim, H. S. & Drolet, A. (2003). Choice and Self-Expression: A Cultural Analysis of Variety-Seeking. *Journal of Personality and Social Psychology*, 85(2), 372–82. <https://doi.org/10.1037/0022-3514.85.2.373>

Leung, E., Poalacci, G., & Puntoni, S. (2018). Man Versus Machine: Resisting Automation in Identity-Based Consumer Behavior. *Journal of Marketing Research*, 55(6), 818–31. <https://doi.org/10.1177/0022243718818423>

Longoni, C., Bonezzi, A., & Morewedge, C. K. (2019). Resistance to Medical Artificial Intelligence. *Journal of Consumer Research*, 46(4), 629–650. <https://doi.org/10.1093/jcr/ucz013>

Luo, X., Tong, S., Fang, Z., & Qu, Z. (2019). Frontiers: Machine vs. Humans: The Impact of Artificial Intelligence Chatbot Disclosure on Customer Purchases. *Marketing Science*, 38(6), 937–47. <https://doi.org/10.1287/mksc.2019.1192>

Markets and Markets. (2019, June). Household Robots Market by Offering (Products & Services), Type (Domestic, Entertainment, & Leisure), Application (Vacuuming, Lawn Mowing, Companionship, Elderly, & Handicap Assistance, Robot Toys and Hobby Systems), and Geography – Global Forecast to 2024. <https://www.marketsandmarkets.com/Market-Reports/household-robot-market-253781130.html>

Marr, B. (2019, March 8). 5 Major Robotics Trends to Watch for in 2019. *Forbes*. <https://www.forbes.com/sites/bernardmarr/2019/03/08/5-major-robotics-trends-to-watch-for-in-2019/#47f8d1f56500>

Marr, B. (2020, January 13). The 5 Biggest Smart Home Trends in 2020. *Forbes*. <https://www.forbes.com/sites/bernardmarr/2020/01/13/the-5-biggest-smart-home-trends-in-2020/#1e9fd69389b>

Mende, M., Scott, M. L., van Doorn, J., Grewal, D., & Shanks, I. (2019). Service Robots Rising: How Humanoid Robots Influence Service Experiences and Elicit Compensatory Consumer Responses. *Journal of Marketing Research*, 56(4), 535–56. <https://doi.org/10.1177/0022243718822827>


Niemelä, M., Heikkilä, P., Lammi, H., & Oksman, V. (2019). A Social Robot in a Shopping Mall: Studies on Acceptance and Stakeholder Expectations. In O. Korn (Eds.), *Social Robots: Technological, Societal and Ethical Aspects of Human-Robot Interaction* (pp. 1–288). Springer. <https://doi.org/10.1007/978-3-030-17107-0>

Olsen, G. D. & Pracejus, J. W. (2020). Customized Advertising: Allowing Consumers to Directly Tailor Messages Leads to Better Outcomes for the Brand.

mers' perceived uniqueness threat as a potential barrier to adoption. They should consider circumventing this threat by offering consumers the opportunity to tailor the product to their unique needs and preferences.

Despite the robustness of the reported experimental findings, this research has limitations that offer opportunities for future research. Further research could test other ADPs (besides cooking appliances), such as social robots or autonomous vehicles, to explore whether the uniqueness threat occurs across different product categories. It could also test non-domestic domains in which resistance to automation has been observed. Exploring whether the uniqueness threat also applies to service robots (e.g., Pepper;

SoftBank Robotics, Tokyo, Japan) or industrial robots offers another fruitful avenue for future research. In the present experiment, consumers were able to tailor an autonomous cooking appliance to their eating and cooking preferences as well as to their household situation. A further promising opportunity for customization might arise with the advent of autonomous vehicles. In this case, consumers could be given the possibility to tailor an autonomous vehicle to their driving style (e.g., sporty, ecofriendly).

Given the speed at which ADPs are being developed and deployed, this paper offers impactful and timely insights into ways of anticipating and improving consumers' perception of these products. 

Journal of Business Research, 116, 245–57.  
<https://doi.org/10.1016/j.jbusres.2020.04.054>

Porter, M. E. & Heppelmann, J. E. (2014, November). How Smart, Connected Products Are Transforming Competition. Harvard Business Review. <https://hbr.org/2014/11/how-smart-connected-products-are-transforming-competition>

Prassler, E., Munich, M. E., Pirjanian, P., & Kosuge, K. (2016). Domestic Robotics. In B. Siciliano & O. Khatib (Eds.), Springer Handbook of Robotics (pp. 1-1611). Springer Handbooks. <https://doi.org/10.1007/978-3-540-30301-5>

Puntoni, S. (2018). Amazing Machines and the Quest for Meaning in Consumption. Marketing Intelligence Review, 10(2), 19–23. <https://doi.org/10.2478/gfkmir-2018-0013>

Rijdsdijk, S. A. & Hultink, E. J. (2003). Honey, Have You Seen Our Hamster? Consumer Evaluations of Autonomous Domestic Products. Journal of Product Innovation Management, 20(3), 204–16. <https://doi.org/10.1111/1540-5885.2003003>

Rijdsdijk, S. A. & Hultink, E. J. (2009). How Today's Consumers Perceive Tomorrow's Smart Products. Journal of Product Innovation Management, 26(1), 24–42. <https://doi.org/10.1111/j.1540-5885.2009.00332.x>

Schmitt, B. (2019). From Atoms to Bits and Back: A Research Curation on Digital Technology and Agenda for Future Research. Journal of Consumer Research, 46(4), 825–32. <https://doi.org/10.1093/jcr/uc2038>

Schweitzer, F. & van den Hende, E. A. (2016). To Be or Not to Be in Thrall to the March of Smart Products. Psychology and Marketing, 33(10), 830–42. <https://doi.org/10.1002/mar.20920>

Schweitzer, N., Gollnhofer, J. F., & de Bellis, E. (2019). Consumer Perceptions of Autonomous Shopping Systems. Alexandria. <https://www.alexandria.unisg.ch/publications/261036>

Sengupta, J. & Johar, G. V. (2002). Effects of Inconsistent Attribute Information on the Predictive Value of Product Attitudes: Toward a Resolution of Opposing Perspectives. Journal of Consumer Research, 29(1), 39–56. <https://doi.org/10.1086/339920>

Snyder, C. R. & Fromkin, H. L. (1980). Uniqueness. The Human Pursuit of Difference. Plenum Press. <https://doi.org/10.1037/h0081340>

Sung, J. Y., Grinter, R. E., & Christensen, H. I. (2009). "Pimp My Roomba": Designing for Personalization. Proceedings of the 27th International Conference on Human Factors in Computing Systems, USA, 193–96. <https://doi.org/10.1145/1518701.1518732>

Tian, K. T., Bearden, W. O., & Hunter, G. L. (2001). Consumers' Need for Uniqueness: Scale Development and Validation. Journal of Consumer Research, 28(1), 50–66. <https://doi.org/10.1086/321947>

von Hippel, E. & Katz, R. (2002). Shifting Innovation to Users via Toolkits. Management Science, 48(7), 821–33. <https://doi.org/10.1287/mnsc.48.7.821.2817>

Wertenbroch, K. (2019). From the Editor: A Manifesto for Research on Automation in Marketing and Consumer Behavior. Journal of Marketing Behavior, 4(1), 1–10. <https://doi.org/10.1561/107.00000006>

White, K. & Argo, J. J. (2011). When Imitation Doesn't Flatter: The Role of Consumer Distinctiveness in Responses to Mimicry. Journal of Consumer Research, 38(4), 667–80. <https://doi.org/10.1086/660187>

Wu, T. (2018, February 16). The Tyranny of Convenience. New York Times. <https://www.nytimes.com/2018/02/16/opinion/sunday/tyranny-convenience.html>

Young, J. E., Hawkins, R., Sharlin, E., & Igarashi, T. (2009). Toward Acceptable Domestic Robots: Applying Insights from Social Psychology. International Journal of Social Robotics, 1, 95–108. <https://doi.org/10.1007/s12369-008-0006-y>

## Manufacturer information

Amazon. <https://amazon-presse.de/Service/Suche/Produktdetail/amazon/de/Devices/Echo-Plus-2018/> (retrieved December 5, 2020)

AppAdvice. <https://appadvice.com/app/official-cookidoo-app/714004506> (retrieved December 4, 2020)

Blue Frog Robotics. <http://www.bluefrog-robotics.com> (retrieved December 2, 2020)

Bosch. <https://www.bosch-home.com/ne/product-list/WAK20200ME#/Toggle-box=614578130/> (retrieved December 4, 2020)

Deere. [http://www.deere.de/common/media/r2/campaigns/tango/de/index.html?dws\\_referrer=reif.la](http://www.deere.de/common/media/r2/campaigns/tango/de/index.html?dws_referrer=reif.la) (retrieved December 2, 2020)

iRobot. [https://www.irobot.ch/de-ch/bundles?gclid=Cj0KCQiAk53BRD0ARsAJuNhpv-Wb7LUUEaQFxfJ8MfA7FCWNFHRrUuphCwE-sF8Ta8Xs5P5XTqe9YaAj5rEALw\\_wcB](https://www.irobot.ch/de-ch/bundles?gclid=Cj0KCQiAk53BRD0ARsAJuNhpv-Wb7LUUEaQFxfJ8MfA7FCWNFHRrUuphCwE-sF8Ta8Xs5P5XTqe9YaAj5rEALw_wcB) (retrieved December 2, 2020)

SoftBank Robotics. <https://www.softbank-robotics.com/emea/en/pepper> (retrieved December 4, 2020)

Techstudio. [https://techstudio.ch/products/rosle-elegance-topfset-10-tlg-edelstahl-18-10-2-ton-poliert-mit-topfen-glasdeckel-pfanne-beschichtet-innenskalierung-induktionsgeeignet-spulmaschinengeeignet?variant=36014717993116&utm\\_medium=cpc&utm\\_source=google&utm\\_campaign=Google%20Shopping&gclid=Cj0KCQiAk53BRD0ARsAJuNhpv-Wb7LUUEaQFxfJ8MfA7FCWNFHRrUuphCwE-sF8Ta8Xs5P5XTqe9YaAj5rEALw\\_wcB](https://techstudio.ch/products/rosle-elegance-topfset-10-tlg-edelstahl-18-10-2-ton-poliert-mit-topfen-glasdeckel-pfanne-beschichtet-innenskalierung-induktionsgeeignet-spulmaschinengeeignet?variant=36014717993116&utm_medium=cpc&utm_source=google&utm_campaign=Google%20Shopping&gclid=Cj0KCQiAk53BRD0ARsAJuNhpv-Wb7LUUEaQFxfJ8MfA7FCWNFHRrUuphCwE-sF8Ta8Xs5P5XTqe9YaAj5rEALw_wcB) (retrieved December 4, 2020)

Vorwerk. (a). <https://www.vorwerk.com/de/de/c/home/produkte/thermomix> (retrieved December 2, 2020)

Vorwerk. (b). <https://www.vorwerk.co.uk/cookbook/tm5-basic-cookbook-en/p/20542> (retrieved December 4, 2020)