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## Augmented Reality Makes Me Feel So Excited: Evidence from Physiological and Self-Reported Measures

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The market for augmented reality, which can be defined as the integration of digitally created media within an existing real environment, is projected to increase from roughly 5.91 billion in 2018 to more than 198 billion in 2025 (Statista, 2019). Companies around the world have been growingly using AR as an advertising tool to showcase the products and services they sell in their retail stores. Examples of AR applications that might simplify consumers' decision making are Ikea Place, that enables customers to place the company's furniture wherever they imagine it in their homes (Joseph, 2017) and Shopify AR, that allows customers to remotely explore every part and every angle of their products (Beachamp, 2018). Despite the growing application of augmented reality in advertising, there is limited understanding about how customers experience their interaction with the augmented reality and how it differs from a traditional advertising (e.g. standard paper-based advertising).

While a few studies have demonstrated a positive attitude of customers toward AR advertising (Yaoyuneyong et al., 2016), sufficient empirical evidence proving the ability of AR to engage customers above and beyond traditional 2D advertising and the processes that underlie customers' enhanced experience with AR is lacking (Javornik, 2016). Obtaining this knowledge is very important as it would offer scientific support to companies' growing interest to invest in AR.

Aiming to fill this gap, this article studies the physiological responses to and actual and post experiences with AR in order to offer relevant insights about customers' experience with AR advertising. The study predicts that customers will show enhanced physiological responses and self-reported experiences when exposed to AR versus traditional 2D advertising, and this will in turn lead to an enhanced willingness to buy for the advertised products. This study offers two experiments, conducted on an online platform typically used to recruit participants in behavioral studies (i.e., Amazon Mechanical Turk) and one laboratory experiment to test its hypotheses.

In particular, Study 1 (online experiment) analyses how traditional advertising and AR advertising influence the Willingness to Buy (WTB) of a customer. For both of the experimental conditions (traditional vs AR communication) we used three different furniture from the IKEA catalogue (SANDBACKEN sofa, KVISTBRO basket, MICKE desk). In the traditional advertising condition each product has been shown as page of catalogue on a computer screen, while in the AR condition each product has been presented through a video of the products selected in the Ikea Place application. The results of Study 1 show that the use of AR leads to a higher WTB compared to traditional advertising. The effect of AR (vs. traditional) advertising on WTB is mediated by the perceived novelty and by the customer engagement with the communication tool. Specifically, AR compared to traditional advertising, leads to higher perceived novelty and customer engagement, resulting in higher customers' willingness to buy the product experienced in the AR.

Using the experimental protocol of Study 1, Study 2 shows that the effect occurred in Study 1 is moderated by customers' score on neuroticism, a personality trait related to emotional regulation, whereby individuals scoring high on neuroticism tend to be more emotionally reactive, especially under stress. In particular, results of Study 2 demonstrate that the positive effect of perceived novelty on customer engagement with AR, in turn, on consumers' willingness to buy the product shown in the AR is more likely to occur for customers who are relatively low, rather than high, on neuroticism.

Moreover, Study 3 (lab experiment) allowed participants to interacted with the advertising using an iPhone 6S. In the traditional advertising condition each product has been shown as the page of the catalogue on the screen of the smartphone, while in the AR condition each product has been presented through the IKEA Place application that allowed participants to project the furniture in the surrounding space and to rotate and shift it at will. The results of Study 3 show that the effect of novelty on willingness to buy (Study 1 and 2) can be explained by customers' physiological arousal, derived from galvanic skin responses measures, whereby the increase in perceived novelty caused by the AR is producing higher unconscious emotional response which in turn results in higher customers' willingness to buy.

Overall, this study suggests marketing managers to use AR to increase their customers' unconscious emotional responses and conscious experiences, thereby improving customers' willingness to buy the advertised product. Moreover, our findings indicate that replacing traditional ads with augmented reality ones enhances customer experience and willingness to buy for customers scoring low on neuroticism, with possible implications on customer segmentation and marketing communication. Finally, our physiological results suggest that consumer neuroscience methods and measures can add value to traditional research that seeks to predict advertising effectiveness.

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