The Effect of Sensory Visual Presentations on Consumer's Buying Decisions: A fMRI Study

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Background and purposes: For experiential products such as apparel, sensory-enabling presentation strategies that provide the analogy of tactile experience have been suggested as an effective strategy to reduce perceived risk and increase the likelihood of a pleasurable shopping experience. Thus, increasingly, more and more online websites use complex visual presentations such as image zooming and product rotation to increase consumers' positive responses (Kim & Forsythe, 2008). Jai, O'Boyle, & Fang (2014) suggest that different visual presentation strategies, evoke different cognitive and affective brain functions during the encoding and purchase decision processes. However, the underlying process by which sensory-enabling presentations affect consumer neurophysiologic responses for purchase decision making has been largely unexplored. Knutson, Rick, Wimmer, Prelec, & Loewenstein (2007) suggested neural correlates predict purchase decisions better than the subjects' self-report variables (i.e., product preference). Therefore, adding neuroimaging results may be a better choice for studying consumer decision making than using the traditional self-report method alone. Thus, the study aims to investigate the brain areas recruited in the encoding process under the three common sensory-enabling presentations, namely, static pictures, image zooming, and rotation videos.
Methodology: In this study, the researchers focused on a common consumer product; women's dresses. Twenty-four right-handed, normal weight female participants (18-30 years old) participated in the study. Participants were offered $50 to bid on dresses for themselves during the MRI scanning as compensation for their participation. Each participant was required to view one-piece dresses and decide how much she would like to bid. The one-piece dresses were presented in static picture, zooming or model rotation videos in separate blocks. Each block contains 20 dresses purchase decisions. Participants were told they were bidding against other participants and they would be notified of the bidding results once the data collection within 7 days. The IRB where the study was conducted approved this study.
Analysis and results. Using SPM8 (http://www.fil.ion.ucl.ac.uk/spm/software/spm8/), a general linear model (GLM) analysis was applied to reveal the brain regions involved in purchase-related cognitive processes. Thus study focus on understanding brain activation associated with the *buy* vs. *notbuy* decision during visual presentation (encoding process). A *buy* trial was defined as a trial in which the subject bid any price greater than $0 for the product displayed during that trial. A *notbuy* trial was defined as a trial in which the subject bid $0 for the product displayed. The participants made a similar number of *buy* versus *notbuy* decisions in each presentation block [Picture block=54%, SD=.50; Zooming block=53%, SD=.50; Rotation block=54%, SD=.50; $F(2, 1197) = .09$, *n.s.*].

Fig. 1 shows differences in brain activation between the *buy* and *notbuy* encoding processes (*buy* > *notbuy*; *notbuy* > *buy*) of each visual presentation condition. In order to determine whether the *buy* or *notbuy* decisions recruit at least one of the same areas of the brain, we conducted a conjunction analysis using full-factorial design (Price & Friston, 1997). The results revealed that inferior parietal lobule (IPL) as the primary neural region recruited in *notbuy* over *buy* contrasts across the three blocks and precuneus was found to be the primary neural region recruited in *buy* over *notbuy* contrasts across the three blocks.

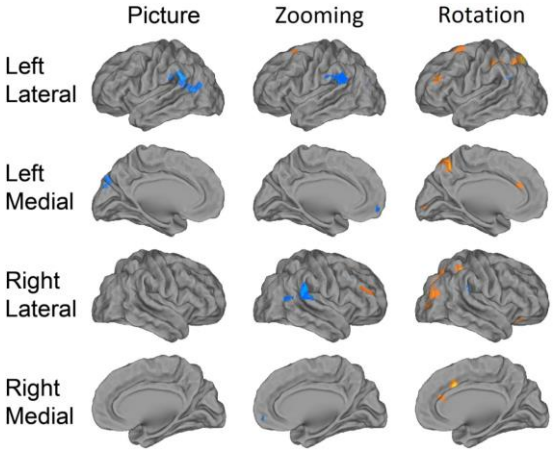

Fig. 1 Red: *buy* > *notbuy*; Blue: *notbuy* > *buy*

Findings and conclusions. GLM results reveal that neural correlates recruited preceding the buy decision (as contrasted with *notbuy* decision) differ among the three visual conditions. As the amount of visual information increases, from static picture to zooming to rotation, participants show increasing use of the precuneus, potentially reflecting an increased use of self-reflection or 'putting myself into' the garment as a key factor driving the purchase decision. This aligns with previous findings that associate the precuneus with this type of self-referencing (i.e., imagining oneself from an outside perspective) (Vogeley & Fink, 2003). On the other hand, the *notbuy* decisions may be driven by other kinds of cognitive tasks. In this study, we observed IPL activations in the *notbuy* minus *buy* contrasts across all blocks. Parietal cortex has been reported to be involved in uncertain decision making and risky choice in financial decision making. Considering the nature of this study, participants may experience a higher level of uncertainty in the encoding process, which in turn, lead to the *notbuy* decisions. Understanding consumers' purchase decision in online presentation strategies, auction, and apparel shopping may illuminate the everyday neural bases of decision process and inform effective online persuasion strategies.

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