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Choosing in the Dark: Effects of Ambient Light on Consumer Choices

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Five experiments show that ambient light intensity influences consumer product choices. Specifically, in dim (bright) lighting, consumers tend to prefer vices (virtues). In the context of food choices, hunger moderates these effects, and process evidence suggests that reduced mental alertness in dim lighting may be driving preferences for vices.

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EXTENDED ABSTRACT

When choosing between virtue and vice products, would consumers' choices be influenced by the ambient light intensity (bright vs. dim)? We focus mostly on choices between healthy (virtue) and unhealthy (vice) food items. However, we also test the robustness of our findings in a non-food context. Understanding how ambient light influences consumers' choices is practically relevant since in most retail contexts managers can control ambient lighting. Given the rates of obesity worldwide (Chandon and Wansink 2011), choosing between healthy/virtues and unhealthy/vices has important implications for managers/regulators and consumers. In spite of the conceptual and practical implications, we know of no study that examines how ambient light intensity impacts consumer choice.

BACKGROUND

Building on prior research streams, two alternative hypotheses can be proposed. First, research in the domain of sensory compensation would suggest that deficiency or weakness in one sensory modality gets compensated for with increased acuity in other sensory modalities (Hoover et al. 2012). Based on this literature stream, we propose that dim ambient light reduces visual capabilities and leads other sensory modalities to become more sensitive and alert. If this holds, a consumer is more likely to choose the virtue/healthy item when the ambient light is dim (vs. bright).

Research in the domains of sleep behavior and disinhibition will predict an opposite pattern of results. Specifically, consumers might be more mentally alert and less sleepy in bright (vs. dim) light, because among other physiological changes, bright light suppresses melatonin, which is the primary controller of circadian (day/night) sleep bio-rhythms (Lowden et al. 2004). Thus, consumers would be less mentally alert in dimly (vs. brightly) lit environments, and therefore less likely to rely on cognitive effortful processing when choosing between virtue and vice products. Second, consumer decision-making would more disinhibited in dim (vs. bright) ambient light since dark/dim lights give people a sense of illusory anonymity and encourage moral transgressions (Zhong et al. 2010). Thus, theories related to both mental alertness and disinhibition would predict greater preference for vices/unhealthy foods when the ambient light is dim (vs. bright).

Study 1a

Study 1A was a between-subjects experiment with two manipulated conditions (ambient light: bright vs. dim). Participants sat at a table with, a mixed fruit cup (healthy/virtue) and a cheesecake (unhealthy/vice), and indicated their preference between the two options. Mental alertness and disinhibition were also measured (Gilberg et al. 1994; Stunkard and Messick 1985).

As predicted, in dim (bright) ambient light a greater proportion of participants chose the unhealthy (healthy) option. Process measures show mediation by mental alertness but not by disinhibition.

Study 1b

Study 1B extended these findings to a non-food domain. The procedure and experiment design were similar to Study 1A except that participants were asked to allocate \$1,000 worth of windfall

money to fun (e.g. vice) or necessary (e.g. virtue) activities (e.g. Biswas et al. 2011).

Consistent with our prediction, participants allocated a larger proportion of the budget to fun (necessary) activities in dim (bright) lighting.

Study 2

Study 2 directly examined which of the two alternative underlying processes (mental alertness vs. disinhibition) might be more dominant by examining the moderating effects of hunger. Hunger affects mental alertness and disinhibition in different ways. High (vs. low) hunger leads to sensory arousal (Radel and Clemant-Guillotin 2012) and enhances mental alertness. Hence, if diminished mental alertness led to increased choice for the unhealthy/vice in dim lighting, enhancing mental alertness through high hunger, should enhance choice of the healthy food option in dim lighting (no such effects expected with bright light where alertness is already high).

In contrast, high hunger enhances disinhibition because visceral factors diminish consumers' ability to exhibit self-control (Loewenstein 1996). So, if disinhibition led consumers to choose the unhealthy/vice to a greater extent under dim light, then enhancing disinhibition through high hunger should further enhance preference for the unhealthy/vice with bright light (but not for dim light, where disinhibition is already high). Hence, an alternative prediction would be that under low hunger the effects found in Study 1A will persist, but under high (vs. low) hunger, there will be greater preference for the unhealthy/vice in bright (but not dim) ambient light.

Study 2 was a field experiment at a restaurant, with a 2 (ambient light: bright vs. dim) X 2 (hunger: low vs. high) between subjects design. Participants were asked to choose between a fruit salad (healthy/virtue) and chocolate cake (unhealthy/vice) right before (high hunger) or right after (low hunger) their meal.

Consistent with the mental-alertness account under high (vs. low) hunger there was enhanced choice for the healthy/vice in dim lighting.

Study 3

In Study 3, we gain additional process evidence by directly manipulating mental-alertness through the use of high (vs. neutral) alertness ambient scents (Spangenberg et al. 1996).

If ambient light influences consumers' choices via mental alertness, then adding a high-alerting ambient scent to a dimly lit environment should enhance preference for the healthy option; in bright lighting, mental alertness is already high irrespective of the ambient scent.

Study 3 was a 2 (ambient light: bright vs. dim) x 2(ambient scent: high vs. neutral alertness) between-subjects experiment. The procedure and stimuli were identical to Study 1A except that in the high (neutral) alertness condition a lemon (lavender) scent was diffused throughout the laboratory where the study took place.

The results showed that in dim lighting participants were more likely to choose the healthy/virtue in the presence of a high (vs. neutral) alerting ambient scent. However, in bright lighting there was no difference in choice of the healthy/virtue option based on ambient scent.

Study 4

While the previous studies had forced choice scenarios, in Study 4 we varied the ambient light intensity at a restaurant and un-

obtrusively observed customer ordering of healthy (vs. unhealthy) food items from the regular menu. We found that the proportion of healthy (vs. unhealthy) items sold varies with light intensity with the greatest proportion of healthy (unhealthy) items sold in the brightest (dimmiest) lighting.

CONCLUSION

Our experiments show that dim (vs. bright) ambient light enhances choice for vice products.

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