The Sweet Side of Sugar – the Influence of Raised Insulin Levels on Price Fairness and Willingness to Pay

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Pricing research has traditionally analyzed e.g. consumers judgments of price fairness in terms of consumers’ relationship to retailers. This investigation is one of the first that explores the biological correlates of raised insulin levels on buying decision behavior in a price fairness task in order to provide new findings for marketing researchers. The analysis of our data revealed that the perceived price fairness and willingness to pay changed after glucose manipulation. The estimated effects could confirm our assumption that glucose stimulates the monoamine serotonin which finally results in neural activation and in different consumer behavior.

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Study 2
Study 2 (n=138) was conducted to clarify and extend study one results. The same stimuli and method were used. Dependent variables focused on mood, self-reported attention to ads (vs. ignoring them), and ad recognition. No mood effects were present for either the hungry (F(2,69)=1.42, p>.2) nor the non-hungry groups (F(2,67)=1.56, p>.2). As expected, for the non-hungry participants there were differences by viewing group with the task groups reporting significantly lower attention to ads (F(2,68)=6.75, p<.005). However, for hungry participants there was no difference in self-reported attention to the ads between groups (F(2,69)=.043, p>.9). This suggests that for hungry participants bottom-up processing may override the top-down goal. Recognition scores also confirm that the devaluation effect most likely occurs without any explicit recognition of ads.

Overall the studies show that the outcome (negative or positive) may depend on goal at time of exposure.

References

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Psychologists Daniel Kahneman and Amos Tversky have influenced the research in consumer psychology and behavioral economics over the last thirty years (Tversky and Kahneman 1974). While their findings have been useful in many fields of marketing research, they were particularly useful for pricing in behavioral pricing (e.g., Conover 1986; Vanzuile and Drèze 2002). Pricing research has traditionally analyzed such concerns as consumer judgment of price fairness in terms of the consumers’ relationship to retailers. However, Knutson et al. (2007) moved the research in a new direction when they used event-related fMRI to investigate which distinct brain areas are activated in purchasing decisions dealing with products and prices. They found activity associated with anticipating gains and losses at the nucleus accumbens (NAcc), the insula, and the mesial prefrontal cortex (MPFC). Findings of Knutson et al. (2001) and Kenning and Plassmann (2008) show a specific stimulation of the NAcc in anticipation of a reward, indicating the importance of the NAcc in consumer behavior studies. Further, the role of serotonin, which has long been implicated in social behavior (Kandel et al. 2000) and which is believed to play an important role in activating the NAcc (Purves et al. 2008) can be linked to raised levels of tryptophan in the NAcc (Crockett et al. 2008). If, therefore, raised levels of serotonin are associated with higher levels of tryptophan, and knowing that raised levels of insulin in the blood increase the supply of tryptophan (Daniel et al. 1981), the link between insulin level and social behaviors (particularly those associated with consumer behavior) suggests a valuable area of investigation.

Though the effects of e.g. dopamine levels in humans have increasingly been in the focus of academic scrutiny in the field of economics (Balleine et al. 2009), the effects of serotonin has, to date, received less attention. This investigation is one of the first to explore the biological correlates of raised insulin (and hence serotonin) levels on buying decision behavior in a price fairness task, with the goal of providing new findings for psychologists and marketing researchers.

Our study used a paper-based presentation of 48 convenience goods (24 premium brands, 24 store brands, colored pictures, prices in D), intending to activate a low-involvement situation for the participants of the study (Monroe and Lee 1999). Involvement was checked

1Diffuse positive affect as shown by mood is posited to be a factor in MEE (Monahan, Murphy and Zajonc, 2000)
using the Purchase Decision Involvement (PDI) scale developed by Mittal (1989), consisting of a four-item measure on seven-point bipolar phrases. Participants had to decide whether or not they considered the given price of a product to be “fair” and, if not, what price they would be willing to pay with the option to adjust prices for each individual product. In the forced-choice-task, each subject had to evaluate six items for one product (288 decisions). A May 2008 pretest containing 10 subjects confirmed validation and distinctiveness of both the stimulus material and the translated items. The pretest also served as a first measure of the effects of different glucose manipulations on the subjects. In February 2009, 37 selected undergraduate students (21 male, 16 female) participated in the main study. We divided the participants into three groups. Subjects of the experimental group (14 subjects) were manipulated using 90 grams (recommended daily allowance for a healthy adult) of pharmaceutical glucose dissolved in 0.3 liter of sparkling water. Control group I (14 subjects) had to drink 0.3 liter sparkling water with no glucose added to the water. Control group II (nine subjects) drank no water and was not manipulated at all. Study design for every participant followed precisely the insulin release curve of a healthy adult metabolic subject (Suckale and Solimena 2008) to match the hypothetical insulin level of the subjects to their respective response behavior.

Statistical analyses were conducted with SPSS. For the analysis of our data we used a simple independent t-test, including “Levene’s Test” to explore equality of means and variances between our study groups. Normal distribution condition was examined with the Shapiro-Wilk-Test, which is generally used for small sample sizes (n<50). The analysis of our data and the identified structures with significant changes between the experimental group and the two control groups revealed very interesting results, confirming our hypothesis that glucose levels change perception of price fairness and willingness to pay.

The experimental group evaluated all prices of our product-portfolio (n=48 products) to be more fair than did their counterparts in both control groups |product-portfolio: Mexperimental group=69.93; SD=5.98|Mcontrol group I=62.30; SD=5.77; 69.93 vs. 62.30; t=3.44, p<.01; Mexperimental group/Mcontrol group I=6.14; SD=6.00; 69.93 vs. 63.14; t=2.66, p<.05]. Subjects in the experimental group were willing to pay much higher prices for the same products than were subjects in both control groups. This effect was also revealed by testing different prices of store brands (n=24 products, price-range between 0.29-2.55 ?; M=0.79 ?) and premium brands (n=24 products, price-range between 0.55-11.99 ?; M=2.29 ?). Overall, the experimental group accepted higher prices while subjects in both control groups rejected higher price-levels over total response time within the experiment [store brands: Mexperimental group=20.03; SD=2.21|Mcontrol group =18.69; SD=.73; 20.03 vs. 18.00; t=3.03, p<.01; premium brands: Mexperimental group=49.90; SD=4.36|Mcontrol group =43.61; SD=5.66; 49.90 vs. 43.61; t=3.29, p<.01; Mexperimental group/Mcontrol group =5.14; SD=5.68; 49.90 vs. 45.14; t=2.14; p<.05].

Second, we tested differences between two levels of insulin at two intervals (within the first 10 minutes and after 40 minutes), following the insulin release curve of a healthy adult metabolic subject. The above-mentioned effect differential between the experimental group and the two control groups could be confirmed in the first range of our study over all products (within 10 minutes after glucose manipulation; first peak of insulin release curve). [The following figures indicate price variances of the total sum of the product-portfolio: product-portfolio: Mexperimental group=1.43; SD=2.51|Mcontrol group I=5.90; SD=3.93; 1.43 vs. 5.90; t=3.60, p<.01; Mexperimental group/Mcontrol group I=5.37; SD=3.47; 1.43 vs. 5.90; t=2.95; p<.01.] The same effect was identified by testing premium brands with our study groups, but not for store brands. [The following figures indicate price variances of the total sum of the product-portfolio: premium brands: Mexperimental group=1.43; SD=2.14|Mcontrol group I=5.50; SD=3.83; 1.43 vs. 5.50; t=3.46, p<.01; Mexperimental group/Mcontrol group I=4.86; SD=3.41; 1.43 vs. 4.86; t=2.69, p<.05; store brands: Mexperimental group=1.43; SD=9.0|Mcontrol group =41; SD=55; -0.01 vs. .41; t=1.48;p<.05; Mexperimental group/Mcontrol group =.51; SD=.44; -0.01 vs. 44; t=1.83; p<.05.] In the second range (40 minutes after glucose manipulation; second peak of insulin release curve) the existence of these effects could not be determined significantly.

Our study provided first insights about the biological correlates of raised insulin levels (through oral glucose manipulation) on price fairness perceptions. Statistical analysis showed that higher insulin levels indicate higher price acceptance. The estimated effects could support our assumption that glucose stimulates the monoamine serotonin, which results in neural activation. The effect is likely due to activation in neural areas of emotional regulation. Further research, including the use of fMRI, could determine more reliable insights into the hypothetical “glucose-insulin-tryptophan-serotonin” chain and its effects on distinctive brain areas and, thereby, on consumer behavior.

References


Power Dynamics in Immigrant Families in Britain and Its Effect on Consumption  
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Research into family networks and how they are constructed and sustained through consumption can be criticised for being inherently western-centric and White. Previous studies have tended to focus on key themes such as how individuals influence other family members (Cotte and Wood, 2004), how individuals represent family as aspects of their extended self in terms of consumption (Tian and Belk, 2005), and lastly family member’s influence on consumption (Commuri and Gentry, 2005), to name but a few are often lacking in their focus on ethnic minorities. Despite calls for more research on gender differences in immigrant populations, relatively few studies have been conducted and those that have been studied have been product specific or based upon impulse buying behaviour (Mitchell and Walsh, 2004). This research argues that the current research into immigration, family and consumption practices are lacking in their discussion of idealised norms that govern gender relations in particular the construction of consumption behaviour and consequently power dynamics between husband and wife. The research will, therefore, address this research gap by providing an insight into how immigrant women, through consumption, use power dynamics to assert identities.

Inman et al. (2007) argued that women appear to hold the key to the familial structure amongst immigrant families. Cultural inhibitions, such as the belief that a woman’s primary role is in the home or that women take second place to men is a widely held belief in most immigrant families (Inman et al., 1999); a belief that may lay in transactional gendered socialisation, and the immigrant and the host society’s culture (Jayakar, 1994). However, when migrants’ acculturation process is considered, immigrant women may produce a diverse and fluid range of identity (Üstüner and Holt, 2007). This in turn may cause them to begin to challenge their own, ethnic groups, patriarchal cultural values etc. This act of cultural resistance may exist in the miniature of simple, daily activities yet these acts appear to remain relatively unexplored.

One area where cultural resistance may exist is in the cultural inhibition of the woman’s role in the family household, i.e. subservience behaviour to her husband. In particular how women, through engaging with the consumption process may have opportunities to express acts of cultural, consumption orientated resistance. It has been well documented that culture and self-identity plays a significant role in consumption; in particular how cultural values manifest through consumption of products (McCracken, 1986; Foxall and Goldsmith, 1994; Lindridge and Dibb, 2003). As a result, for example, cultural resistance may occur in modifying food choices which were once chosen in line of the husband’s preference then changed in line of the wife’s preference, and so forth. However, research that encompasses acculturation and cultural resistance, within a culturally determined family dynamic are lacking in consumer research.

Methodology

This research will focus on Black Nigerian immigrants living in Britain. The choice of Black Nigerians is partially one of convenience and also because the Black African population, living in the UK, is relatively understudied in comparison with other visible ethnic sub-groups (Daley, 1998).

This research used two sample groups consisting of ten first generation Nigerian couples (husband and wife) living in Britain and ten British White couples. Both the sample groups were matched for construct equivalence (in terms of age, religious background and socio-economic status) and recruited, using the snowball method of sampling, from London and Manchester.

Taking a Black feminist paradigm, the research was qualitative in nature and used semi-structured and in-depth interviews. The first stage of the fieldwork consisted of conducting preliminary interviews followed by further in-depth interviews with the wives of each couple. This two-stage interview process, conducted over a period of three months, aimed to explore the world of our female participants. It also allowed us to juxtapose the narratives shared with their husbands to the narratives of their individual interview, allowing us to highlight the antecedents of various acts of cultural resistance.

Complimenting the interviews, participating couples were asked to keep receipts of items consumed. These receipts provided points of discussions, for example items purchased that may have caused conflict or tension. This allowed us to explore wider aspects of our participants’ decision-making and how power dynamics, based on gender roles, were acted out.

Preliminary analysis

Preliminary analysis of the data showed that acts of consumption-orientated resistance were evident for all our participants. British white women and Black Nigerian women tended to show similarity through their career path goals, work/family conflict, gender based mistreatment, friendship and community. Both groups showed resistance through the purchase of items without approval from their...