

Preliminary Evidence for the Neurophysiologic Effects of Online Coupons: Changes in Oxytocin, Stress, and Mood

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ABSTRACT

Coupon use saved consumers \$2.9 billion on packaged goods in 2012 with over 90 million Americans using online coupons. Besides saving money, why is coupon use so widespread? An experiment was run where participants ($N = 90$) shopped online and one-half received a coupon worth \$10. It was found that those who received a coupon had a 14% increase in oxytocin (OT), an 8% decrease in the stress hormone adrenocorticotropin, a 4% decrease in heart rate (HR), a 27% decrease in respiration, a 4% decrease in skin conductance levels, and a 90% increase in high-frequency HR variability. These factors showed almost no change for those who did not receive a coupon. The findings indicate that coupons elicit physiological reactions similar to having a positive social interaction. In addition, self-reported happiness correlated with the change in OT ($r = 0.43$). These findings provide new insights into why online coupon use is so pervasive. © 2015 Wiley Periodicals, Inc.

In early 2012, newly hired JC Penney CEO, Ron Johnson, overhauled the business practice of the major retail outlet, ridding it of “fake prices” and instituting a new “fair and square” everyday low-pricing scheme (Tuttle, 2013). Johnson did away with coupons and sales, explaining “I thought people were just tired of coupons and all this stuff” (Tuttle, 2013). JC Penney’s sales sharply declined following the no-coupon revolution and by April 2013, Johnson was fired from his position. It turns out Johnson deeply misunderstood the core base of JC Penney’s shoppers who like couponing and seeing a “how much you saved today” amount at the bottom of their receipts.

Previous moves to eliminate coupons have produced similarly strong responses. In 1995, for example, General Mills instituted “everyday low prices” in lieu of coupons. After other manufacturers failed to follow suit, they quickly resumed issuing coupons (Nevo & Wolfram, 2002). The following year, Procter & Gamble and nine other consumer product manufacturers agreed to stop issuing coupons. They reasoned that since only 2% of coupons are redeemed, eliminating coupons would save money. “There’s nothing effective about a system that fails 98 percent of the time,” P&G spokeswoman Elizabeth Moore noted (Bloomberg Business News, 1996). Consumers, however, saw the situation differently and organized boycotts of P&G prod-

ucts. The companies resumed issuing coupons and paid \$4.2 million to settle charges accusing them of collusion (Nevo & Wolfram, 2002).

These examples reveal the dilemma faced by retailers. While the redemption rate of traditionally distributed paper coupons is very low, consumers appear to be quite attached to them. In 2012, \$305 billion of coupons were distributed, but only \$2.9 billion were redeemed (NCH Marketing Services, 2013). Nevertheless, coupon use continues to grow, especially through the use of online coupons (NCH Marketing Services, 2013). A recent estimate is that one-half of the U.S. adult Internet users, over 100 million people, have redeemed a digital coupon (eMarketer, 2013). Why coupon use has maintained its popularity is not well understood. If coupon use derived only from saving money, secular increases in median income would be expected to reduce their use, especially in light of the time needed to find and clip or print them.

The extant literature has studied various aspects of coupon usage—such as its price discrimination effects (Bester & Petrakis, 1996; Narasimhan, 1984), peak-load pricing (McKenzie & Tullock, 2012; Nagle, 1984; Steiner, 1957), and its overall marketing impact (Nielsen, 1965)—and has analyzed the factors influencing coupon usage (Bawa, Srinivasan, & Srivastava, 1997; Goodwin, 1992). Research on surprise

coupons shows they increase the number and dollar value of unplanned purchases (Beshears, 2009; Heilman, Nakamoto, & Rao, 2002). Positive affect has also been shown to increase variety-seeking behavior (Kahn & Isen, 1993). This effect is attributed to an “elevated mood state,” yet this presumed state change has not been measured.

Research on the behavioral characteristics of coupon usage provides some insight into a possible change of state. Cronovich, Daneshvary, and Schwer (1997) find that consumers’ shopping habits and attitudes explain more variation in coupon usage than do socioeconomic and demographic variables. Tat and Cornwell (1996) report interpersonal influences, price consciousness, perceived time and effort, and self-satisfaction as the main predictors on coupon usage. Consumers are more likely to respond to a coupon offer than the equivalent reduction in the price of the product (Cotton & Babb, 1978). Chandon, Wansink, and Laurent (2000) posit that this behavior occurs because coupons offer value expression, allowing shoppers to signal smart-shopping skills and fulfill personal values and moral obligations. Overall, the primary elements that influence coupon redemption are price and savings, time and effort, and self-satisfaction (Yeshin, 2006, p. 138).

Negative emotions have been found to directly impact intentions to switch brands or terminate a relationship with a service provider. Emotions such as anger cause consumers to communicate to their social network about the disappointment and regret of buying a product or using a service (Zeelenberg & Pieters, 2004). On the other hand, positive affective commitment predicts brand loyalty (Mattila, 2001). Some consumers even develop feelings of obsessive dependency on a brand and seldom or never deviate from purchasing it (Fournier, 1998). In the present study, self-report measures are supplemented, as they may be unreliable (Dewey, 2007), with physiologic assays collected up to 1000 times/second. These measures include cardiac responses, skin conductance, and respiration, as well as changes in neuroactive hormones in blood. The main focus is the receipt of surprise online coupons as these are the fastest-growth coupon segment (Smith, 2012) and provide excellent experimental control.

Neuroeconomics studies have shown that anticipating the receipt of money reliably activates striatal dopaminergic regions, including the nucleus accumbens (Izuma, Saito, & Sadato, 2008; Knutson, Adams, Fong, & Hommer, 2001; Knutson & Bossaerts, 2007; Knutson & Greer, 2008). This midbrain region provides a reward sensation to motivate the acquisition and consumption of goods (Knutson et al., 2001). Acquiring rewards are certainly one reason that coupons are used. But there also could be psychosocial effects from using coupons as suggested by passionate responses when coupons have been eliminated. The emotional response to coupons, and the products they are for, may be an important way to build brand loyalty (Wierich & Zielke, 2014). The present study was designed to quantify these effects if they were to occur. For example,

surprise has been shown to induce increases in heart and respiration rates and skin conductivity, engaging attentional circuits in the brain (Kim, 2010). It will be tested if attentional responses are one reason that online coupons are growing so quickly. An innovation in the authors’ approach is the use of multiple neurologic measurements to generate convergent evidence for neurophysiologic effects.

The present study opted not to use functional magnetic resonance imaging (fMRI) for a number of reasons. First, activation of midbrain dopaminergic regions when anticipating the receipt of money has been shown in a large number of studies (Knutson & Greer, 2008). Second, it was important to create a naturalistic online shopping setting rather than have people lie in a dark tube so that participants’ experiences were ecologically valid and generalizable. Third, the authors sought to capture possible psychosocial effects of coupons. Specifically, they hypothesized that the physiological reaction to a coupon would be similar to receiving a gift from a trusted stranger. Zak, Kurzban, and Matzner (2004) and Zak, Matzner, and Kurzban (2005) found that the intentional gift of money from another person denoting trust induced an increase in oxytocin (OT). A coupon, which has both gift and monetary attributes, may similarly influence brain function as well as mood. Because all physiologic measures are inherently noisy, the authors sought to amass convergent evidence for the physiologic effect of coupons by both measuring changes in hormones in blood as well as changes in peripheral neurologic states via electrocardiogram (ECG), electrodermal activity, and respiration. If coupons indeed have a social component, it would be expected to observe an increase in OT, and relaxation in the peripheral nervous system. Further, it was hypothesized that physiologic changes would be associated with increases in positive mood.

In order to explicate the present experimental design, a model has been developed that extends the authors’ previous work on advertising (Lin, Grewal, Morin, Johnson, & Zak, 2013) to the receipt of online coupons (Figure 1). The model posits that when one receives an unexpected coupon, physiologic responses associated with relaxation and socioemotional arousal will occur. These will cause an increase in positive mood resulting in a behavior such as the purchase of a product. The experimental protocol using this design allows to connect changes in physiology to mood to behavior and to measure effects at each causal node.

MATERIALS AND METHODS

Participants

Male and female students and employees from the Claremont Graduate University ($N = 90$, mean age = 24.8 years, $SD = 9.6$) participated in this study. Caucasians made up 66% of the participants, with the

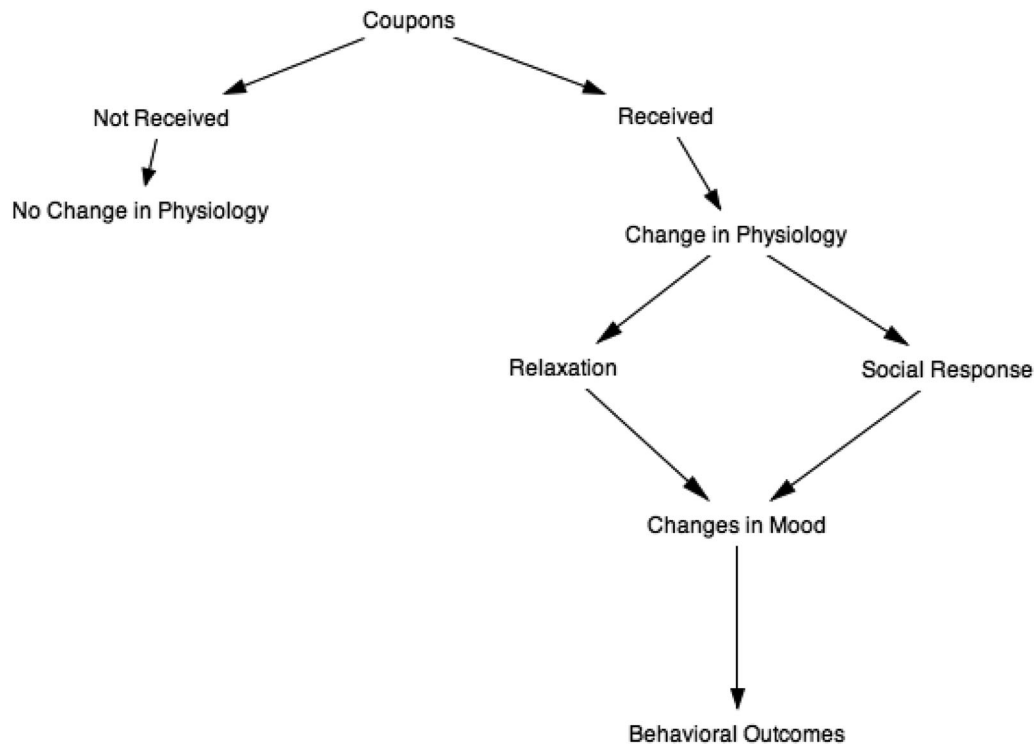


Figure 1. A psychophysiological model of coupons. Coupon receipt causes changes in physiology, leading to changes in mood, producing a behavioral response.

remaining being 14% Asian, 12% Hispanic or Latino, 4% black, and 2% other.

Procedure

The Institutional Review Board approved the experiment, and written consent was obtained from all participants prior to the experiment. After consent, participants completed a questionnaire by computer to assess their psychological traits and to collect demographic information. After completing the survey, 12 ml of blood was drawn from an antecubital vein by a qualified phlebotomist to establish basal OT and adrenocorticotrophic hormone (ACTH) levels. OT has been associated with trust, generosity, and empathy and ACTH is a fast-acting stress hormone indicating physiologic arousal (Gardner & Shoback, 2011). Participants were then fitted with ECG electrodes on the left and right costal arches at the level of the 10th rib, with reference below the right collarbone, two electrodes on the medial phalanx surfaces of the middle and index fingers of the non-dominant hand, and a respiration band around the midchest. These wirelessly sent ECG, respiration, and skin conductance data to a BIOPAC MP150 data-acquisition system for Windows (BIOPAC, Goleta, CA). The total recording time was approximately 12 minutes.

After the basal blood draw and electrode placement, participants were instructed to sit quietly for three minutes looking at a fixation cross on a computer monitor while basal physiology was captured. After this

baseline, participants were instructed to complete a moderately taxing cognitive task for money. The three-minute task asked participants to accurately add 24 two-digit pairs of numbers. Participants were required to complete this task in three minutes with 75% or greater accuracy to earn \$25 (in addition to a \$10 show-up fee). This task was used to compensate participants and to distract them from the treatment task.

Next, participants sat at personal computer and opened an Internet browser to a realistic-appearing online grocery website that was designed for this experiment. Participants were provided with a sheet of paper on which they listed their five favorite items to purchase. They were instructed to shop for items they liked and add them to their online shopping basket until an amount of roughly \$70 was reached. After this three-minute task, participants who were in the coupon group had a button appear on the screen labeled “get coupons” and the experimenter instructed them to click on it. Once participants clicked this button, a screen popped up stating “Woo Hoo! You have coupons! You’ve been awarded coupons worth \$10. It’s like free money.” A research assistant then gave participants a paper certificate that could be redeemed at checkout for \$10. Participants then sat quietly for three minutes while neurophysiologic data were collected. Then, participants had a second 12 ml blood draw that completed data collection. Electrodes were removed and a lab administrator paid participants their earnings in private.

Table 1. Summary Statistics for Physiologic Measures Comparing the Three-minute Shopping Period and Three-minute Postcoupon Period.

	Shopping		After Coupon		<i>t</i>	One-tailed
	<i>M</i>	SD	<i>M</i>	SD		<i>p</i>
SCL	3.00 (43)	0.84	2.89 (43)	0.85	3.40	<0.01
NS-SCR	11.53 (38)	9.84	4.71 (38)	6.77	4.38	<0.01
HR	73.95 (44)	11.99	70.88 (44)	11.57	4.05	<0.01
ln (HF-HRV)	6.75 (43)	0.97	7.18 (43)	1.28	2.80	<0.01
Respiration	18.26 (32)	3.45	13.12	3.81	7.33	<0.01

Note: Sample sizes are in parentheses.

The participants in the control group sat quietly for three minutes after the online shopping task, without the coupon button appearing. After this period, they had a second 12 ml blood draw and then had their electrodes removed. The treatment and control tasks were done in separate rooms and participants were not aware of the differences in conditions. The coupon and no-coupon rooms were counterbalanced between sessions.

A week after their lab visit, the participants were e-mailed and asked to rank on a scale from 1 to 10 their level of happiness after the experiment (with 1 being the least happy). The week delay was included to reduce a possible confound regarding happiness when participants were about to receive money.

Measures

Participants took several personality, demographic, and attitude surveys, including the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), Big-Five Inventory (John, Donahue, & Kentle, 1991), and the Interpersonal Reactivity Index (Davis, 1980). This was done immediately after signing the consent. Participants' initial happiness was assessed using questions for positive affect from PANAS. The change in happiness was measured by the percentage change from initial happiness to its level a week after participants completed the experiment. This approach sought to test if mood changes associated with coupon receipt had temporal persistence. Also included were 10 questions addressing participants' shopping styles and coupon usage. For example, these questions asked participants to agree or disagree with statements such as "I often buy things spontaneously" and "I usually end up spending more money than I originally set out to spend."

Blood Handling and Assays

Following the previously published protocol (Zak et al., 2005), blood tubes were immediately placed on ice after being drawn. The tubes were then placed in a refrigerated centrifuge and spun at 1500 rpm for 12–15 minutes

at 4°C. After centrifugation, plasma was pipetted into 2 ml microtubes with screw caps. Tubes were immediately placed on dry ice and then transferred to a –80°C freezer until analysis.

Assays of OT and ACTH were done using a radioimmunoassay. ACTH was assayed with a kit from DiaSorin (Stillwater, MN), while OT used a kit from Bachem (Torrance, CA). An extraction step was included in the OT assay to eliminate binding of non-OT products (Szeto et al., 2011). The interassay coefficients of variation (CVs) for OT (three replicates) and ACTH (four replicates) were, respectively, 6.9% and 2.5%. Assays were performed by the University of Southern California Division of Reproductive Endocrinology Research Laboratory (Los Angeles, CA).

Electrophysiologic Measures

Cardiac measures included the heart rate (HR), high-frequency HR variability (HF-HRV) measured as frequencies in the 0.12-to-0.45 Hz band (log-transformed to normalize the data), respiration (breaths/minute), skin conductance level (SCL), and the rate of nonspecific skin conductance responses (NS-SCR). A reduction in stress or arousal is generally associated with a decrease in HR, an increase in HF-HRV, a decrease in respiration, and decreases in skin conductance measures (Dawson, Schell, & Fillion, 1972; Dishman et al., 2000; Vrijlkotte, van Doornen, & de Geus, 2000).

Analysis Procedure

Analysis of the neurophysiologic responses was done using paired *t*-tests to assess changes in individuals, while independent samples *t*-tests compared groups (coupon and no-coupon) and assessed correlations. Physiologic values from the shopping were compared to postshopping coupon receipt/nonreceipt periods. Data were excluded if values were greater than 3 SDs from the average. The number of observations for each subgroup is reported in Tables 1 and 2. One-tailed tests are used to test the directional hypotheses for physiologic data and mood described in the introduction.

Table 2. Summary Statistics for Physiologic Measures Comparing the Three-minute Shopping Period and Three-minute Rest Period for the No-coupon Condition.

	Shopping		Quiet Period		<i>t</i>	One-tailed
	<i>M</i>	SD	<i>M</i>	SD		<i>p</i>
SCL	3.50 (38)	0.72	3.46 (38)	0.75	1.18	0.12
NS-SCR	12.89 (36)	8.11	7.19 (36)	5.95	4.12	<0.01
HR	72.17 (39)	12.87	72.52 (39)	10.33	0.21	0.42
ln (HF-HRV)	6.72 (37)	1.10	6.95 (37)	1.34	1.35	0.10
Respiration	18.78 (30)	2.83	14.85	2.64	8.06	<0.01

Note: Sample sizes are in parentheses.

RESULTS

The hypotheses for this study are the following:

1. Participants who receive a coupon will be more relaxed as measured by a larger reduction from baseline in ACTH, HR, SCL, NS-SCR, and respiration, and a larger increase in HF-HRV compared to participants who did not receive a coupon.
2. Participants who receive a coupon will perceive it having social content, reflected in a larger increase in OT compared to noncoupon participants.
3. Those receiving a coupon will have a persistent increase in positive mood compared to participants who did not receive a coupon.

Data were collected and analyzed for 46 participants in the treatment group (coupon) and 44 controls (15 males and 31 females in the treatment group, 11 males and 33 females in the control group). The main reason for including a larger sample of females was that while males play a major role in household shopping, they generally use far fewer coupons than females (Harmon & Hill, 2003). Participants in the two conditions performed equally well in the cognitive task prior to shopping (95.3% accuracy for the no-coupon group, 94.9% accuracy for the coupon group, two-tailed $p = 0.89$). In addition, the percentage changes in physiologic variables from baseline to after the cognitive task were identical (SCL two-tailed $p = 0.35$, NS-SCR two-tailed $p = 0.26$, HR two-tailed $p = 0.20$, respiration two-tailed $p = 0.14$, HF-HRV two-tailed $p = .97$). This shows that both groups had equivalent physiological states prior to the shopping task.

Endocrine Response

Consistent with the authors' hypothesis, it was found that those who received a coupon after shopping had a 14% increase in mean OT (one-tailed t -test $p = 0.05$). Participants who did not receive a coupon had 7.8% increase in OT but the difference was not different than zero (one-tailed t -test $p = 0.07$, Figure 2). Participants who received a coupon had a 7.85% decrease in the stress hormone ACTH (one-tailed t -test $p = 0.05$). Those

who did not receive a coupon had no change in ACTH ($p = 0.41$, Figure 3).

Cardiac Response

HR decreased 3.92% for participants who received a coupon (one-tailed $p = 0.01$, Figure 4). In the control group, HR did not change (two-tailed $p = 0.40$). The percentage change in the HR between groups was significantly different (one-tailed $p = 0.02$). It was found that HF-HRV increased for both the treatment (89.87%, one-tailed $p = 0.01$) and the control group (40.6%, one-tailed $p = 0.02$). The coupon group had a marginally larger increase difference in HF-HRV (one-tailed $p = 0.06$). HF-HRV during shopping was correlated with trusting others ($r = 0.33$, $p < 0.01$).

Respiration Response

Respiration decreased for both the coupon and control group. Mean respiration fell by 27% for the participants who received a coupon (one-tailed $p = 0.01$) and by 20% for the control group (one-tailed $p = 0.01$). The difference between groups was significant (one-tailed $p = 0.05$).

Electrodermal Response

Participants who received a coupon had a mean 3.7% decrease in SCL (one-tailed $p = 0.01$, Figure 5). Those who did not receive a coupon had no significant change (one-tailed $p = 0.09$). There was a significant difference in the mean percentage change of SCL between the two groups (one-tailed $p = 0.02$). It was also found that NS-SCR decreased 59% for those who received the coupon (one-tailed $p < 0.01$, Figure 6), but did not significantly decrease for those who did not (24%, one-tailed $p = 0.07$).

Survey Data

Self-reported values of happiness revealed that those who received a coupon were 49% happier after the experiment than before it (one-tailed $p < 0.01$), while controls were 31% happier (one-tailed $p < 0.01$). The

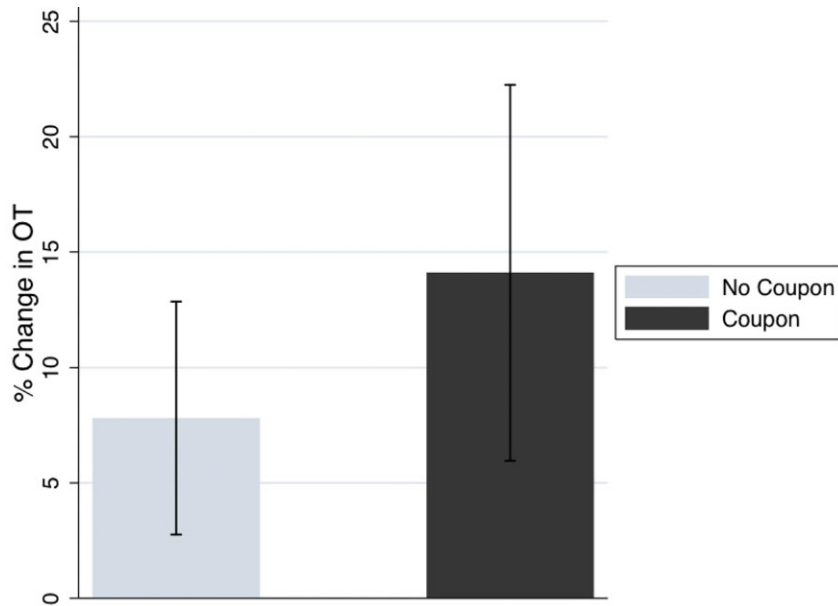


Figure 2. The receipt of a coupon after shopping was associated with a within-subject increase in OT of 14% (one-tailed $p = 0.05$), while those who shopped and did not receive a coupon had an increase in OT that was not statistically different than zero (one-tailed $p = 0.07$). Error bars are ± 1 SE.

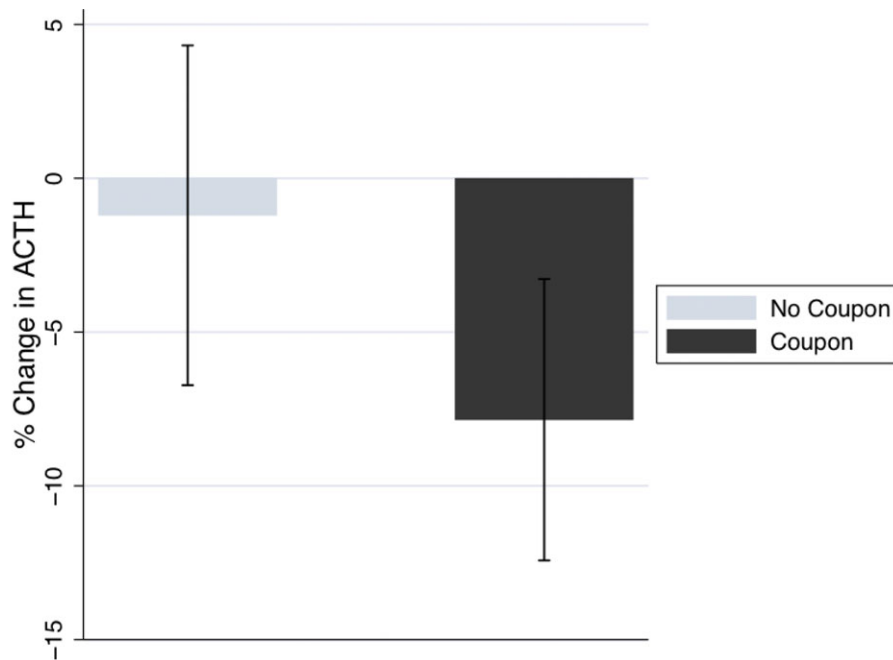


Figure 3. Those who received a coupon had a within-subject 7.85% reduction in the stress hormone ACTH (one-tailed $p = 0.05$), while those who did not receive a coupon had no change in ACTH (one-tailed $p = 0.83$). Error bars are ± 1 SE.

difference was not statistically different between groups (one-tailed $p = 0.07$).

There was a positive correlation between the self-reported change in happiness and the percentage change in OT for the participants who received a coupon ($r = 0.43$, $p = 0.03$). There was no correlation between the change and OT and happiness for the participants who did not receive a coupon ($p = 0.71$).

DISCUSSION

This study is the first to analyze the physiologic effects of coupons, including their impact on hormones. The results show that participants who received a coupon had, relative to baseline, a 14.1% increase in OT, 7.9% decrease in ACTH, 3.9% decrease in HR, 27.3% decrease

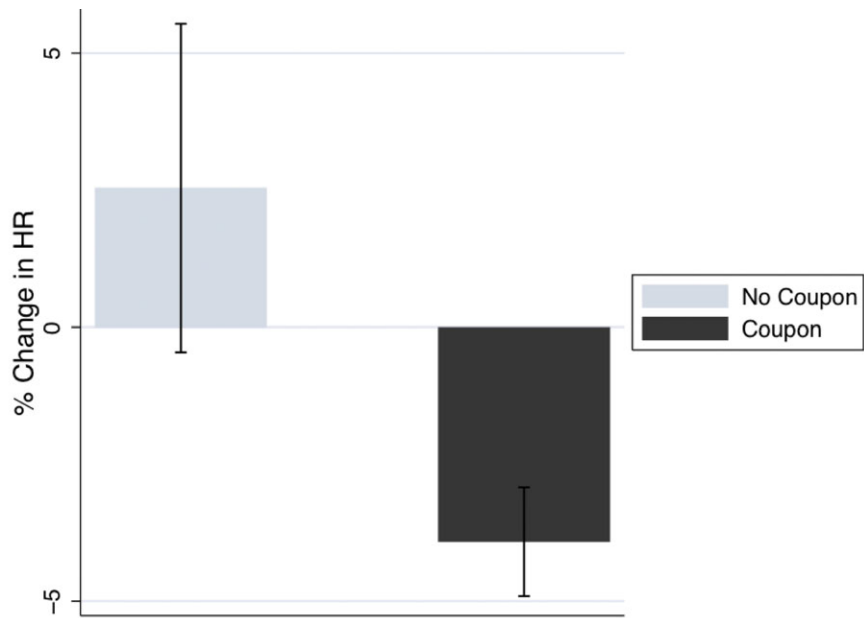


Figure 4. HR decreased 3.9% for the coupon condition (one-tailed $p < 0.01$), but did not change for the no-coupon condition (one-tailed $p = 0.20$). Error bars are ± 1 SE.

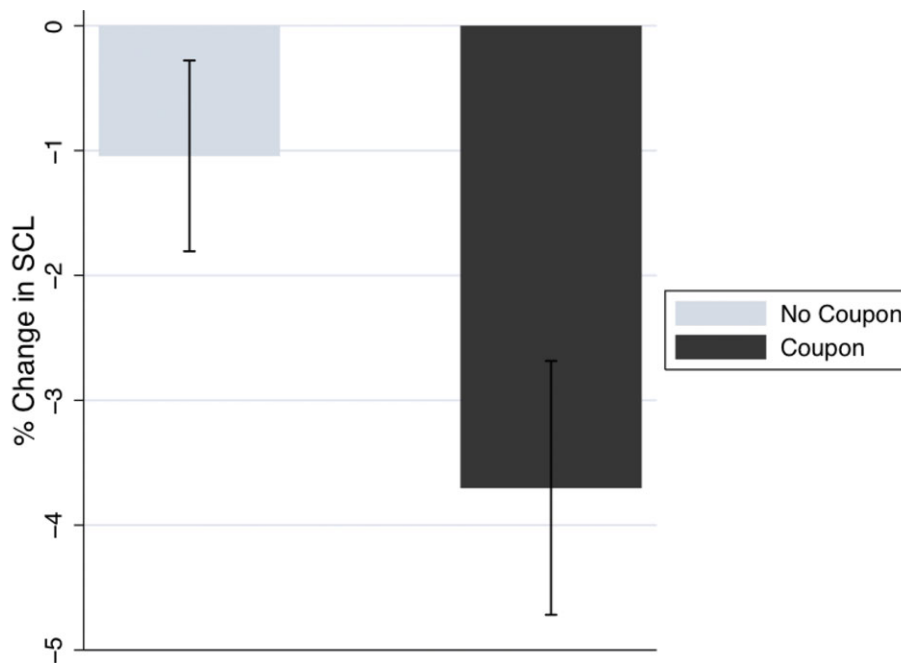


Figure 5. Skin conductance response (SCL), a measure of stress, decreased 3.7% (one-tailed $p < 0.01$) after coupon receipt. There was no change in SCL for those who did not receive a coupon (one-tailed $p = 0.09$). Error bars are ± 1 SE.

in respiration, 3.7% decrease in SCL, 59% decrease in NS-SCR, and an 89.9% increase in HF-HRV. Participants who did not receive a coupon had insignificant changes in OT, ACTH, HR, SCL, and NS-SCR, and a significant 20% decrease in respiration and 40.6% increase in HF-HRV. The most remarkable finding is that OT was stimulated by the receipt of an online coupon. That is, surprise online coupons appear to be processed

in the brain as if they were a gift and endowed with social content. In a decade's worth of experiments studying behavioral triggers for OT synthesis, only positive social interactions have been shown to produce a surge in OT (Zak, 2012). The OT response for coupons that was found may be due to the physical receipt of the coupon from a person after the online notice. Consistent with the positive effect on mood from an increase

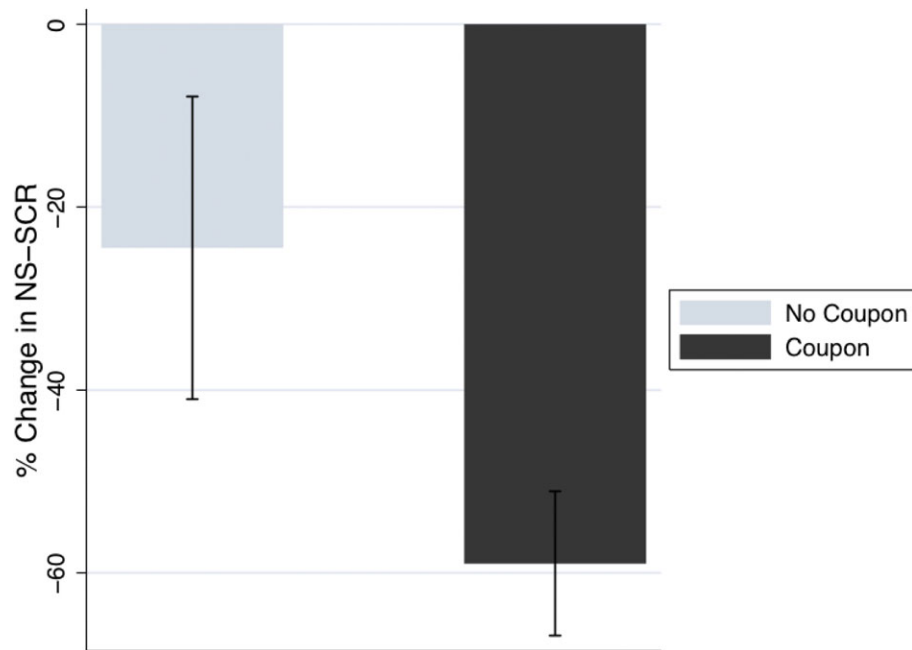


Figure 6. Nonspecific skin conductance response decreased 58.9% for the coupon condition (one-tailed $p < 0.01$), but did not significantly decrease for the no-coupon condition (one-tailed $p = 0.07$). Error bars are ± 1 SE.

in OT, the change in OT was correlated with the change in happiness for those who received a coupon.

Convergent evidence reported here shows that coupons reduce physiologic stress from five physiologic measures as well as the change in the fast-acting stress hormone ACTH. Coupons reduce physiologic arousal, and thereby may initiate a feedback loop that reinforces their use by making users comfortable. Furthermore, low arousal reduces vigilance toward objects in one's environment (Hartel, Uhlenhuth, Fischman, & McCracken, 1981). As a result, coupons may reduce comparison shopping and move consumers toward more rapid purchase decisions for the coupon item. There is evidence that when people have a coupon for a particular brand, they tend to choose that brand rather than a competitor (Sen & Johnson, 1997).

The previous literature on coupons has primarily focused on the psychological factors that influence consumer use. For example, Babakus, Tat, and Cunningham (1988) propose that the relationship between motivational factors and coupon use starts with the consumer saving money and receiving a good feeling from smart shopping, and this reinforces future coupon use. One source of "good feelings" from coupons may be the release of OT and the relaxing sensations this produces. Alternatively, Tat and Cornwell (1996) and many others (e.g., Fogel & Thornton, 2008) have focused on the cost-benefit trade-offs of couponing; that is, saving money. The present study's findings are more primal than cost-benefit calculations that occur in the brain's evolutionarily newer prefrontal cortex (Knutson & Bossaerts, 2007). The release of OT occurs in evolutionarily old regions of the human brain that

motivate social engagement and are largely outside of conscious awareness (Zak, 2012). This is not to say that consumers do not do a cost-benefit analysis and evaluate the savings associated with using coupons, but that the social and gift aspects of coupon receipt are likely to precede a cost-benefit calculation regarding use as the latter typically occur more rapidly than the former.

Indeed, OT has been shown to induce midbrain dopamine release, generating a pleasurable sensation (Bale, Davis, Auger, Dorsa, & McCarthy, 2001). This suggests another route, besides saving money, that explains why coupons are "sticky" and their use continues to grow. The findings show that coupons are attractive not only because they save consumers money but also because they induce a feeling of social connection. This mechanism may help companies retain customers by building physiologic attachment to a product or brand. Indeed, those who report an emotional relationship with a brand have significant brand loyalty (Mattila, 2001). The finding that a surprise coupon induces OT release suggests other surprise strategies may be effective ways to build "brand love." Surprise marketing strategies include offering unexpected gifts via loyalty programs, providing a birthday gift or coupon, or providing early access to a store or product. For example, Canadian low-cost airline WestJet surprised travelers during the 2013 Christmas season with customized surprise gifts on the luggage carousel after they landed (Hardy, 2013). MasterCard has a continuing Priceless Surprise campaign that provides an amazing surprise to customers. One of these surprising was having pop star Justin Timberlake go to a fan's house to "hang out" (Oster, 2014).

When surprise marketing campaigns benefit the needy or underprivileged, the OT effect can be even stronger (Lin et al., 2013; Zak, 2012). OT release is associated with attachment to loved ones, activating the brain's social connection circuit. Lin et al. (2013) showed that effective public service announcements similarly induce OT release. Marketing campaigns that focus on social behaviors and emotional connections are likely to have more impact than those that do not. Indeed, creating positive emotions increases word-of-mouth marketing and brand switching (Zeelenberg & Pieters, 2004). Such methods are effective and low-cost ways to increase market share. The physiologic effect found in the present study from surprise coupons shows why these strategies are likely to work.

This study also has implications for the use of on-line coupons as this segment continues to grow. Even though businesses such as Groupon and LivingSocial are struggling, the findings suggest coupon sharing reinforces the social nature of coupons that the present experiment has revealed. To the extent that companies that issue coupons accentuate their social and gift-like qualities, they are likely to reinforce the release of OT and make them more attractive. Spark Commerce's GIFT (Give Incentives For Transacting) Network that provides consumers with a gift after a purchase taps into the OT effect and may increase additional purchases (Business Wire, 2012). The health benefits of social relationships are well established (Zak, 2012), and the present study's findings suggest there may be a physiologic benefit of "retail therapy"—at least if it includes coupon use.

Future studies should manipulate other aspects of coupons besides surprises to test their physiologic and behavioral effects. These include varying face value, physical versus online coupons, brand awareness/previous exposure, and the use of visuals. A systematic approach to understanding the physiologic impact of coupons will provide new insights into why people use some coupons but not others. This knowledge will be valuable to marketers and retailers, and can improve the shopping experience for consumers.

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