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The Lipstick Effect Operates at the Level of Automatic Visual Attention

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The University of Southern Mississippi

THE LIPSTICK EFFECT OPERATES AT THE LEVEL OF AUTOMATIC VISUAL
ATTENTION

by

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Abstract

Although general consumer spending usually decreases during economic recessions, Hill and colleagues (2012) found evidence that women concerned with economic recession demonstrated an *increased* preference towards purchasing products capable of enhancing physical beauty, thereby allowing them to appear more attractive to mates with resources. Referring to this phenomenon as the lipstick effect, these researchers suggested such purchasing preferences demonstrate evidence for an evolved female mating strategy. The current study was designed to more directly test whether the lipstick effect represents an evolved female mating adaptation by determining if it operates at the level of automaticity, specifically automatic visual attention (Fodor, 1983). Female participants were randomly assigned to a recession prime or control prime condition (via condition-specific writing prompts) and then completed a dot-probe visual attention task that assessed automatic attentional bias toward beauty and non-beauty products. Consistent with the hypothesis that the lipstick effect operates at the level of automatic visual attention, women in the recession prime condition had greater difficulty disengaging their attention from beauty compared to non-beauty products (i.e., automatic attentional adhesion to beauty products relative to non-beauty products); no comparable effects were found for women in the control condition. These findings demonstrate that the lipstick effect operates at the level of automaticity, thereby providing additional evidence that it may be a female-specific mating adaptation.

Keywords: visual attention, motivation, evolutionary psychology, resource scarcity,

mating

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The Lipstick Effect Operates at the Level of Automatic Visual Attention

From 2008 until only very recently, the United States and much of the rest of the industrialized world were mired in one of the worst economic recessions since the Great Depression (Business Wire News, 2009). During this economic crisis, there were numerous reports of layoffs, home foreclosures, general stagnation, and a steady decline of the overall economy (Baily & Elliott, 2009). Not surprisingly, these dire economic conditions were mirrored by changes in spending patterns; that is, consumers responded by reducing their spending budgets significantly, including spending on basic necessity items such as groceries (Bohlen, Carlotti, & Mihas, 2010). From a rational economic perspective, such changes in spending patterns are quite logical. According to rational choice theory, rational choices are those in which the individual balances costs against benefits to arrive at an action that maximizes personal advantage (Friedman, 1953). This reduction in general spending under conditions of economic downturn is rational in the sense that an individual is engaging in a behavior to conserve personal resources in an environment of relative scarcity.

However, closer inspection of spending behavior indicates that not all purchasing behavior in a poor economic climate is consistent with purely rational accounts of human behavior. For example, although spending on the majority of consumer products during the recent economic recession predictably declined, one specific product category experienced surprising growth: beauty products (Allison & Martinez, 2010; Schaefer, 2008). In one striking example of this spending pattern, L'Oréal, one of the world's largest cosmetic companies (marketing primarily to female consumers), reported 5.3% sales growth in 2008, even when the rest of the economy was in relative decline (Elliot,

2008). This seemingly irrational pattern of spending by female consumers has not gone unnoticed, with journalists in the popular media referring to this phenomenon as the lipstick effect (Nelson, 2001). Although this term has entered the lexicon only recently, such patterns of consumer spending have been discussed in the context of other economic declines and are even thought to have occurred during the Great Depression, when sales of women's cosmetics products experienced a relative boom (Koehn, 2001).

While such behavior may seem economically irrational (i.e., excessive spending on superficial goods under conditions of resource scarcity), recent research provides theoretical and empirical evidence that the lipstick effect may be quite rational in terms of evolutionary fitness. Specifically, Hill and colleagues (2012) utilized Parental Investment Theory (PIT; Trivers, 1972) to explain why it is sensible for women to increase spending on beauty products during times of relative economic scarcity. While we outline the logic of their arguments and summarize their findings below, the rationale for the lipstick effect is as follows: historically, when an environment would have been characterized by high levels of resource scarcity, this may have had extensive fitness costs for females as it would have reduced the availability of resources for her and her offspring. However, by investing heavily in activities that would enhance their physical attractiveness toward potential mates who had greater access to resources, women may have increased their likelihood of offsetting the high costs of reproduction in an environment relatively devoid of resources. Specifically, these men with greater access to resources may then have been interested in pair-bonding with these more attractive women, and been more willing to invest their resources in these women and any offspring the two mutually produced. Thus, women's increased interest in spending on

beauty products during contemporary recessions may be manifestation of this evolved mate acquisition adaptation, and may be quite rational from an evolutionary perspective.

Parental Investment Theory and Human Mating

All animals reproduce sexually and sex differences in human mating psychology and behavior are determined by several factors. For example, sex differences in mating strategies (sexual selection) are likely to occur in species in which the reproductive rate between the two sexes is large and one sex's mandatory minimum investment in offspring is greater (Workman & Reeder, 2014). Human reproduction includes both of these factors. First, men's absolute reproductive rate is significantly faster than women's. After copulation, men are capable of reproducing within minutes; however, a successful copulation for a female leads her to be reproductively unavailable for almost one year (~9 months of pregnancy, as well as during the early stages of nursing before her sexual cycle allows for subsequent ovulation). Thus, female reproductive rate is significantly slower than men's (i.e., approximately one year versus a few minutes).

Moreover, Parental Investment Theory argues that in any species, if one sex's mandatory minimum investment in offspring is greater than that of the other sex, then the sex with the larger mandatory minimum investment will be more selective with whom they mate (to avoid making poor mating decisions), whereas the other sex will compete with members of their own sex for access to the choosier sex (intrasexual competition; Trivers, 1972). In humans, the mandatory minimum investment for males with respect to creating an offspring is a sperm; however, women's mandatory minimum investment in offspring is much larger as women have to consume additional caloric resources to facilitate pregnancy and lactation. Thus, because a slower rate of reproduction reduces

the absolute number of reproductive opportunities over the lifetime, and because each act of reproduction for women will be more expensive than it is for men, women are much choosier with whom they mate.

To offset their greater costs associated with reproduction, women should prefer male mates who demonstrate greater access to resources and a willingness to invest those resources in her and her offspring (Trivers, 1972). Conversely, because men's reproductive rate is faster and their reproduction is limited only insofar as they can identify healthy females to mate with, men should be motivated to identify physically attractive females because such physical attractiveness is associated with good genes and fertility (e.g., Rhodes, 2006; Singh, 1993). Indeed, cross-cultural research indicates that men tend to prioritize female physical attractiveness in mates, whereas women tend to prefer men with access to resources and who display high levels of commitment (Buss, 1989). Based on these differential preferences, women (and men) may be motivated to accentuate their own levels of those characteristics that the other sex deems desirable, in order to attract members of that sex who possess desirable characteristics. For example, if women are attracted to men with access to resources, then women might be motivated to enhance their physical attractiveness towards men with resources, since men value this characteristic (i.e., physical attractiveness) in women. Therefore, by becoming more physically attractive to men who have access to resources, women may gain access to men with resources, which would offset their costs related to reproduction.

According to Hill and colleagues (2012), such accentuation behaviors by females should be particularly likely when the environment communicates resource scarcity. Specifically, when the environment is void of resources critical to offsetting the resource

costs associated with female reproductive constraints, women should be especially motivated to become physically attractive to men, particularly men with access to resources. By outcompeting other women on the dimension of physical attractiveness, women increase their likelihood of obtaining a male mate with resources to invest in her and any potential offspring her and the male produce. Thus, the lipstick effect, or the phenomenon whereby women increase their amount of spending on physical beauty products under conditions of economic scarcity, could be considered adaptive, from an evolutionary perspective.

Consistent with this logic, Hill and colleagues conducted a series of studies that supported the lipstick effect phenomenon. In their first study, they examined data collected by the Bureau of Labor Statistics (Bureau of Labor Statistics, 2011) for the average monthly unemployment rate from 1992-2012, using this as a metric for economic recession. They also obtained data from the U.S. Census (U.S. Census Bureau, 2011) for the total amount of retail sales during that time period. Importantly, they were able to analyze retail sales figures across five product categories, two of which (personal care and cosmetics products) were associated with physical appearance enhancement and the remaining three product categories (furniture, electronic, leisure/hobby products) were unrelated to appearance enhancement. Consistent with rational choice models of human behavior, they found that unemployment rate was negatively correlated with spending on products that were unrelated to physical attractiveness-enhancement; that is, poor economic conditions predicted reduced spending on products unrelated to attractiveness-enhancement. Consistent with the lipstick effect (and evolutionary decision-making), however, unemployment rate was positively correlated with spending on products

associated with physical-attractiveness enhancement; that is; bad economic conditions predicted increased spending on attractiveness-enhancing products. Because their first study was unable to determine whether these spending patterns were associated specifically with female purchasing behavior, they conducted three additional studies to address this shortcoming.

In study 2, male and female participants were exposed to either a recession cue (a news article regarding the turmoil of modern day economic recession) or a control cue (an article about architecture). Following this, the participants were asked to indicate their purchasing preferences for either beauty (lipstick, perfume, jeans) or non-beauty products (stapler, lamp, computer mouse). Whereas exposure to recession cues had little impact on men's purchasing preferences, women primed with recession cues indicated a greater preference to purchase beauty products compared to women in the control prime condition. Thus, the lipstick effect seems to be specific to female purchasing behavior.

Study 3 extended these findings by including women's desire for fiscal security as a potential mediator of preferences for beauty products under conditions of economic recession. Female participants were again assigned to a recession cue versus control experience condition, and then indicated both their preferences for beauty and non-beauty products, and finally their preference for a partner with fiscal resources. Consistent with the logic of the lipstick effect, women in the recession prime again showed a preference for beauty products more so than women in the control prime condition. Furthermore, women in the recession prime condition indicated a stronger preference for a partner with fiscal resources. Finally, the greater emphasis for a partner with fiscal resources of women in the recession prime condition mediated their preferences for beauty products.

In their final study, Hill and colleagues sought to demonstrate that recession cues would lead women to prefer beauty products regardless of cost, if they believed it would make them more attractive to a mate with fiscal resources. They once again primed women with either the recession or control prime experience and assessed how interested they were in buying expensive beauty products (designer jeans were their example) versus two types of cheaper products: non-beauty products (coffee) and cheaper beauty products (Walmart brand jeans). Consistent with the previous studies, women primed with recession cues (compared to women in the control prime condition) demonstrated a greater willingness to purchase expensive brand-name products; women primed with recession cues did not show an enhanced preference to purchase “cheap” beauty products as such products are less effective for enhancing attractiveness to potential mates (i.e., women primed with recession cues showed an enhanced preference for designer jeans, but not Walmart brand jeans). Collectively, Hill and colleague’s (2012) findings document consistent evidence for the lipstick effect: when women are primed with economic recession concerns (i.e., environmental scarcity), they actually prefer to spend more on beauty products than they otherwise would, and appear to do so in order to increase their physical attractiveness towards mates with resources.

Given the nature of the above findings, one might argue that an evolutionary explanation for the lipstick effect is potentially unnecessary. Specifically, one could argue that independent of reproduction, women with limited economic potential might adopt strategies to attract men with greater economic potential for their own comfort and need fulfillment, independent of “mating” motivations. Such a perspective is consistent with a social roles explanation for the lipstick effect (see Eagly & Wood, 1999).

Although plausible, additional results from Hill and colleagues' fourth study (2012) provide evidence against this latter explanation. Specifically, when women's own resource need was assessed, the results indicated that women across all levels of socioeconomic status (from relatively poor to relatively affluent) demonstrated increased interest in purchasing beauty products when primed with recession cues. Because social roles theory would predict that the lipstick effect is a reflection of resource-deprived women seeking resources from men in any way they can, including through attractiveness enhancement, this theory offers a less adequate explanation of the phenomenon than comparable evolutionary theories.

Is the Lipstick Effect a Female Adaptation?

Consistent with theories that outline the specific factors that constitute a psychological adaptation, Hill and colleague's findings demonstrate the concept of domain-specificity that is necessary for a pattern of behavior to be considered adaptive (Cosmides & Tooby, 1992). Domain-specificity refers to the idea that adaptations evolved to solve problems in particular domains, rather than to act as general response tendencies. The fact that recession cues (but not cues unrelated to recession) led women (but not men) to prefer to spend more on beauty products (but not all products) seems to meet this requirement of domain-specificity, and provides initial evidence that the lipstick effect may be an evolved female psychological adaptation.

However, because Hill and colleagues (2012) only assessed women's explicit preferences for beauty versus non-beauty products, their research failed to test another important requirement for determining whether a pattern of behavior represents an evolutionary adaptation: automaticity. According to Bargh (1994), automaticity is

defined as a process that operates outside of conscious awareness (i.e., person is unaware of the mental process that is occurring), occurs unintentionally (i.e., person is not involved with the initiation of the mental process), is efficient (the process requires few mental resources), and is uncontrollable (the person is incapable of stopping or altering the process once it is initiated). According to several definitions of psychological adaptations, most adaptations operate largely at the level of automaticity (Fodor, 1983; Cosmides & Tooby, 1992). Thus, if the lipstick effect is truly demonstrative of a female adaptation, its operation should occur at the level of automaticity.

Visual attention Bias and Automaticity

Researchers interested in visual attention often use a dot probe visual attention task to measure visual attentional adhesion to stimuli (e.g., MacLeod, Mathews, & Tata, 1986). Briefly, individuals are shown images from various categories in a particular location on the computer screen. That image is then replaced with a probe (e.g., asterisk) displayed in either the same location as the previous image (congruent trials) or in a different location as the previous image (incongruent trials). To the extent that an initial image captures one's visual attention, that person finds it more difficult to disengage their attention from that stimulus to find the visual probe when it is displayed in a different location than the prior image, which is reflected in slower response times on incongruent trials.

Research exploring visual attention biases utilizing various dot probe paradigms indicates that attentional processes are adaptively attuned: features of the environment of greater relative importance *automatically* capture attention (McArthur & Baron, 1983; Posner & Peterson, 1990) and perceivers are inefficient at pulling their attention away from stimuli that are highly relevant to their current needs and goals (Fox, Russo, Bowles, &

Dutton, 2001). Quite literally, their attention becomes ‘stuck’ on important self-relevant stimuli, a process referred to as attentional adhesion (Maner, Gailliot, Rouby, & Miller, 2007). As an example of this process as it relates to evolved psychological mechanisms, recent evidence has found that being primed with mating can increase individuals’ attentional adhesion to desirable mating partners (i.e., physically attractive opposite sex targets; Maner et al., 2007).

Leveraging this logic, if recession primes are a motivational cue for women, and beauty products become a relevant stimulus category based on women’s current needs, then the same logic of attentional adhesion (and therefore, automaticity) should apply to the lipstick effect. Specifically, when women are primed with recession cues and exposed to beauty products and non-beauty products, their visual attention should automatically adhere (they should become visually stuck) to beauty products compared to non-beauty products, compared to women in a control prime condition. As such, they should be slower to disengage their attention from beauty products to find a different stimulus located elsewhere. Thus, the current study used a visual search task (dot probe) to assess women’s attentional adhesion to beauty and non-beauty products when primed with either a recession cue or a control cue, in order to determine the extent to which the lipstick effect operates at the level of automaticity in terms of a visual attention bias. The results demonstrated that the lipstick effect does operate at the level of automaticity in the context of visual attention; specifically, women primed with recession cues did take longer to disengage their attention from beauty products compared to non-beauty products; women in the control condition did not demonstrate differential attentional adhesion to beauty and non-beauty products.

Method

Participants

Seventy-three women (Mean age: 21.29 years, $SD=5.22$ years) were recruited from The University of Southern Mississippi's psychology research participation pool (via the online SONA system). The sample was comprised of 36 African American participants, 33 Caucasian American participants, two Asian participants, and one Hispanic participant; one additional participant indicated "Other" for their race. Participants who volunteered for the study were eligible to receive extra credit toward psychology courses in which they were enrolled at the time of their participation. On a between-participants basis, women were randomly assigned to the recession or control prime conditions (participants across conditions read different articles that served as the priming task). All participants then completed a comprehension task in which they were instructed to summarize the content of the article prime that they read (as a manipulation check for the effectiveness of the priming task), followed by a dot probe attention task assessing their attentional adhesion with respect to beauty and non-beauty products. Thus, the study utilized a 2 Condition (recession, control) x 2 Product Type (beauty, non-beauty) x 2 trial Type (congruent, incongruent) mixed model design with repeated-measures over the second and third factors.

Materials and Procedures

After obtaining informed consent (Appendix A), participants were instructed that the study consisted of a reading comprehension task and an unrelated visual attention task. Participants were randomly assigned to read one of two articles serving as the manipulation of recession cues. Specifically, half of the participants were assigned to

read an article about severe economic recession (Appendix B), whereas the other half of the participants were assigned to read a control article about various kinds of architecture (Appendix C). Importantly, Hill and colleagues (2012) pretested these writing tasks in their own work on the lipstick effect to confirm that the only difference between the two articles was the fact that the recession prime article led to significantly greater activation of economic concern than the control prime article. The participants were given a physical copy of the article to read, and after reading it they were asked to return the article to the experimenter. Following this, they were instructed to type a summary of the article at their computer station, as a measure of their comprehension for the article; in actuality, this comprehension task served as a measure of whether participants paid attention to the article they were asked to read.

Following the comprehension task, all participants completed a dot probe visual attention task at their computer station, designed to assess their automatic visual attention toward beauty and non-beauty products. In order to increase the number of unique trials in the dot-probe task, we used a combination of beauty (form-fitting jeans, form-fitting black dress, lipstick) and non-beauty products (computer mouse, stapler, headphones) from previous research (Hill et al., 2012) as well as additional beauty (handbag, perfume, designer shoes) and non-beauty products (desk lamp, pen, table; see Appendix D for images used in the current study). Participants were instructed that their task was to identify the location of an asterisk (right or left side of the screen) as quickly as possible on each trial, using the right and left control (Ctrl) keys on the keyboard, respectively. Specifically, on each trial, an image of a beauty product or a non-beauty product appeared on the screen for 500ms, followed by a visual mask. Then, the asterisk

appeared either in the same location as the previous image (congruent trials) or on the opposite side of the screen (incongruent trials). Importantly, this task is able to determine the extent to which beauty and non-beauty products differentially ‘capture’ participants’ visual attention by comparing response times on incongruent (versus incongruent) trials for beauty and non-beauty products for participants in the recession and control prime conditions. The dot probe task consisted of 96 total trials, 48 trials utilizing beauty products and 48 trials utilizing non-beauty products. Within each product type, 24 trials involved the asterisk being displayed in the same location as the prior product image (congruent trials), whereas 24 trials involved the asterisk appearing on the opposite side of the screen as the prior product image (incongruent trials). Because this task utilized six unique beauty and six unique non-beauty products, there were four congruent and incongruent trials for each product.

Following this visual attention task, participants completed a brief demographics form (Appendix E). Embedded in this form were three statements participants responded to that assessed their current, adult socioeconomic status (1=*strongly disagree*; 7=*strongly agree*): “I have enough money to buy the things I want,” “I don’t worry too much about paying my bills,” “I don’t think I will have to worry about money too much in the future.” These items were taken from Griskevicius and colleagues (2011; Appendix F). Finally, participants were given a debriefing form (Appendix G) and thanked for their participation.

Results

Because this study’s hypotheses were specific to individuals in their primary years of reproduction, we chose to only include participants who were 25 years of age or

younger, given that research demonstrates a decline in female fertility as early as women's mid 20s (Dunson, Colombo, & Baird, 2002); this led us to exclude six participants from the primary analyses.¹

Dot Probe Reaction Time Data Preparation

We followed procedures outlined by Ackerman and colleagues (2009) for preparing the dot probe data for analysis. First, we removed trials from the dot probe in which participants provided an erroneous response (6.3% of trials). Second, we removed trials in which participants' response latency was faster than 200 ms or greater than 2.5 *SD* from the mean (0.6% of trials). Finally, we log transformed the participants' reaction times to correct for skew associated with reaction time data (see Ratcliff, 1993 for more details regarding transformations of reaction time data). As is common practice in dot probe research (e.g., Ackerman et al., 2009), participants whose accuracy on the dot probe task was at or only slightly above chance (i.e., accuracy between 50-51%) were removed from analyses (N=5 participants). Thus, the final sample included 62 participants (31 participants in the recession prime condition and 31 participants in the control prime condition). Importantly, even though we excluded 11 participants from analysis (6 based on age and 5 based on performance on the dot probe task), the sample still included enough participants in order for this study to have the statistical power to detect the effect associated with our primary hypothesis (we required a minimum of 60 participants for this study). Furthermore, because the assessment of adult SES was relatively reliable ($\alpha=.68$), we created a composite SES score for each participant to include as a control variable in the primary analyses.

Manipulation Check:

For participants whose dot probe data was retained for analysis, we used language analysis software (Language Inquiry and Word Count; LIWC; Pennebaker, Francis, & Booth, 2001) to conduct a content analysis of participants' essays from the manipulation check task. Specifically, this software's dictionary can code the frequency of various content categories in written text. To confirm the effectiveness of the recession prime (versus control prime), we conducted independent samples *t*-tests to determine if participants' summaries of the recession prime article contained more linguistic content associated with employment and finances. The LIWC software has dictionary categories for the content areas of occupations/jobs and money. The results confirmed that the recession prime was effective; recession prime participants' summaries contained significantly more occupation/jobs-related words ($M=8.78\%$, $SD=5.06\%$) than did control prime participants' summaries ($M=2.41\%$, $SD=3.34\%$), $t(51.98)=5.85$, $p<.001$, $d=1.49$. Recession prime participants' summaries also contained significantly more money-related words ($M=1.77\%$, $SD=1.61\%$) than did control prime participants' summaries ($M=0.00$, $SD=0.00$), $t(30)=6.12$, $p<.001$, $d=1.55$. Given that the recession prime article was about difficulty obtaining jobs and financial security, and the fact that recession prime participants' summarize contained more content related to jobs and money, it appears that the recession manipulation was effective.

Influence of Recession Cues on Visual Attention toward Beauty and Non-beauty Products

Given that this study's primary hypothesis was related to attentional disengagement (e.g., reaction time on incongruent trials), we first analyzed participants' reaction times by conducting a 2 Condition (recession prime, control prime) x 2 Product

type (beauty product, control product) x 2 Trial type (congruent, incongruent) mixed model ANCOVA with repeated measures over the second and third factors. We included participants' adult SES score as a covariate to ensure that results were driven by evolutionary, rather than social roles theory explanations for any predicted findings (see Hill et al., 2012). Specifically, if participants' SES was a significant covariate in the model or interacted with any other factors, this would suggest that automaticity in the lipstick effect may be driven more by social roles theoretical explanations than evolutionary explanations. A three-way interaction between condition, product type, and trial type would be an initial indication that the influence of the recession prime on attentional processes was specific to incongruent dot probe task trials, and importantly, this three-way interaction was marginally significant, $F(1,59)=3.30$, $p=.074$, $\eta_p^2=.053$. Furthermore, this interaction was not qualified by participants' SES ($p=.88$), which suggests that the results are not well-suited to a social role explanation for the lipstick effect (See Appendix H; although statistical analyses were performed on log transformed reaction times, we report mean reaction times in milliseconds in the figure for ease of interpretation).

To better understand this interaction, we ran two, 2 Condition (recession prime, control prime) x 2 Product type (beauty, control) mixed model ANCOVAs with adult SES as a covariate: one for congruent trials (i.e., trials in which the probe appeared in the same location as the previous product image) and one for incongruent trials (i.e., trials in which the probe appeared in a different location as the previous product image).² Primary support for our prediction that the lipstick effect influences attentional disengagement would be demonstrated by a significant interaction between condition and

product type for incongruent trials; no comparable interaction was predicted for congruent trials. Consistent with our predictions, there was no interaction between condition and product type for congruent trials, $F(1,59)=.02$, $p=.901$, $\eta_p^2=.000$; the only effect to emerge was a main effect of trial type, $F(1,59)=4.60$, $p=.036$, $\eta_p^2=.072$, such that participants, regardless of condition, were slower on congruent trials for beauty products ($M=434.77$ ms, $SD=174.86$ ms) compared to control products ($M=426.05$ ms, $SD=156.30$ ms). Thus, regardless of condition, beauty products tended slow down probe detection compared to control products on congruent trials.

For incongruent trials, there was neither a main effect of product type nor trial type ($ps>.85$). Importantly, the critical interaction between condition and product type was significant, $F(1,59)=4.57$, $p=.037$, $\eta_p^2=.072$. To better understand this interaction, we conducted separate paired samples t -tests comparing attentional disengagement from beauty versus control products, separately for participants in the recession prime versus control prime conditions. Consistent with our primary hypothesis, participants in the recession prime condition were marginally slower to disengage their attention from beauty products ($M=428.80$ ms, $SD=181.10$ ms) compared to control products ($M=406.63$ ms, $SD=127.14$ ms), $t(30)=1.95$, $p=.061$, $d=.14$. However, there was no difference in attentional disengagement from beauty ($M=421.10$ ms, $SD=131.16$ ms) versus control products ($M=433.41$ ms, $SD=181.21$ ms) in the control prime condition, $t(30)=-1.22$, $p=.234$, $d=.08$. Thus, the lipstick does appear to operate at the level of automatic visual attentional disengagement. Whereas the control prime did not differentially influence attentional disengagement from beauty and non-beauty products, participants in the recession prime were slower to disengage their attention from beauty

product compared to non-beauty products. Thus, the recession prime resulted in beauty products capturing participants' visual attention more so than control products.

General Discussion

Previous research provided evidence for the lipstick effect, such that women primed with resource scarcity, via a recession prime, showed a significantly greater preference to purchase beauty products compared to products unrelated to enhancing physical beauty; women in a control condition did not show such differential preferences across the two product categories (Hill et al., 2012). These authors suggested that the lipstick effect is an evolved female mating strategy; that is, by enhancing their physical attractiveness, which is a cue valued by men, women would increase their likelihood of pair-bonding with a mate with access to resources, which would be critical for offsetting women's greater costs associated with reproduction, particularly in environments in which resources are already scarce.

Two additional facets of Hill and colleagues' work (2012) support an evolutionary explanation for their findings. First, the lipstick effect is domain-specific, which is a critical characteristic of adaptations (Cosmides & Tooby, 1992); specifically, only recession cues (but not other cues) lead women (but not men) to show elevated preferences for beauty products (but not non-beauty products). Furthermore, the fact that their findings were not qualified by participants' socioeconomic status argues against social role theory explanations for the lipstick effect (Eagly & Wood, 1999), since social roles theory would hypothesize that only women from low SES backgrounds should display the lipstick effect.

However, Hill and colleagues work only explored the lipstick effect at the level of explicit preferences. Numerous theories suggest that in order for something to be considered a human psychological adaptation, it should operate at the level of automaticity (e.g., Fodor, 1983). The current study addressed this shortcoming by assessing participants' automatic visual attention to beauty and non-beauty products. Specifically, following an article prime to either activate concerns with resource scarcity or a control state, women in the current study completed a dot-probe attention task that assessed automatic attentional adhesion to beauty and non-beauty products (Fox et al., 2001). Importantly, past research indicates that when a stimulus is motivationally relevant to a person's current needs and goals, individuals find it more difficult to disengage their visual attention from that object to identify an object located elsewhere (Maner et. al., 2007).

Consistent with the idea that the lipstick effect operates at the level of automatic visual attention, we found that when women were primed with recession cues, they were slower to disengage their attention from beauty products, compared to non-beauty products, indicating that their visual attention was captured more by beauty than non-beauty products; no comparable effects were found for women in the control condition. Importantly, women's SES did not qualify the attentional findings in the current study, much like in the original work done by Hill and colleagues, which provides additional evidence against social roles theory explanations for this pattern of attentional results, and providing additional evidence for an evolutionary account of the lipstick effect.

Although the current findings provide additional support for the lipstick effect, subsequent research should be conducted to determine whether the lipstick effect is

associated with actual behavior as it relates to beauty and non-beauty products. Specifically, the way we perceive objects in our environment, including how specific stimuli capture our visual attention and our attitudinal evaluation of those stimuli should facilitate behaviors towards those stimuli, which are themselves adaptive (e.g., Dijksterhuis & Bargh, 2001). Thus, individuals should engage in more efficient approach behaviors toward appetitive stimuli and more efficient avoidance behaviors toward aversive stimuli. Indeed, past research using joystick movements to mirror approach (arm flexion) and avoidance motor movements (arm extension) have demonstrated that individuals are faster to engage in approach motor movements toward objects deemed pleasurable and avoidance motor movements toward objects deemed unpleasant (e.g., Chen & Bargh, 1999; Förster, Higgins, & Idson, 1998). Thus, it should be the case that women primed with recession cues would be more efficient at engaging in approach motor movements with respect to beauty products as opposed to non-beauty products compared to women in a control condition. Such evidence would provide additional support that the fluctuations in explicit preferences and automatic visual attention associated with beauty products when women are primed with recession cues are in the service of actual approach behaviors regarding those products.

Additionally, future research would benefit by determining if there is a complementary “wealth-enhancing effect” in men, which becomes activated in the presence of recession cues. Specifically, women primed with recession cues are motivated to enhance their physical beauty because it is a characteristic that is greatly valued by men when evaluating a mating partner. Conversely, because women are enhancing their physical appearance to secure a male mate with resources, men should

then be motivated to self-enhance in the domain of resource access. Thus, perhaps men primed with resources would prefer to purchase “impractical” items such as expensive suits and luxury automobiles to communicate an enhanced access to resources that would aid in securing highly attractive females (e.g., Griskevicius, Tybur, Sundie, Cialdini, Miller, & Kenrick, 2011). Perhaps this preference for products signaling access to resources would extend to visual attention biases and motor behaviors as well.

Conclusion

Past research indicates that cues that activate concerns with resource scarcity, particularly recession-related cues, lead women to demonstrate a domain-specific preference for products capable of enhancing their attractiveness in order to secure male mates with greater access to financial resources, a phenomenon referred to as the lipstick effect (Hill et al., 2012). The current results demonstrate that the lipstick effect operates at the level of automatic visual attention biases as well. Women primed with recession cues display more attentional adhesion to beauty products relative to products unrelated to physical attractiveness enhancement. These findings provide support for the claim that the lipstick effect may be a female mating adaptation.

Endnotes

¹ It is also the case that participants in this study were from the state with the lowest mother age at first birth (22.6 years) of any state in the U.S., suggesting that it may have been sensible to restrict the age range of the current sample (Mathews & Hamilton, 2009). However, when we used a more liberal inclusion criterion (i.e., included all women under the age of 35 years), the results were relatively consistent with those reported in the text. Specifically, the three-way interaction between Condition, Product Type was marginally significant, $F(1,62)=3.12$, $p=.082$, $\eta_p^2=.048$, the two-way interaction between Condition and Product Type for incongruent trials remained marginally significant, $F(1,62)=3.51$, $p=.066$, $\eta_p^2=.054$, and the paired samples t -test comparing reaction times on incongruent trials between beauty and non-beauty products for participants in the recession prime remained marginally significant, $t(31)=1.73$, $p=.093$.

² There was no effect of SES in either 2 Condition (recession prime, control prime) x 2 Product type (beauty, control) mixed model ANCOVAs for congruent and incongruent trials (all $ps>.05$).

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Appendices

Appendix A

Consent Form

1. You are invited to take part in a research study conducted by Aaron Bermond and Dr. Don Sacco in the department of Psychology. Any questions or concerns regarding this research may be directed to Don Sacco (Owings-McQuagge hall; Room 220A; 601.266.6747; Donald.Sacco@usm.edu). This project and this consent form have been reviewed by the Institutional Review Board, which ensures that research projects involving human participants follow federal regulations. Any questions or concerns about your rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406, (601) 266-6820.
2. This study is interested in consumer product preferences. You will be asked to read an article at the beginning of the study. You will then be asked to complete either 1) a visual attention task requiring you to locate an image probe on a computer screen as quickly as possible or 2) a joystick task asking you to push and pull the lever in response to images on a computer screen. Finally, you will be asked to complete a socioeconomic status questionnaire and a brief demographics form. Collectively, the entirety of these tasks will not exceed 30 minutes, and you will receive 1.0 credit for participation.
3. You are free to discontinue your participation in this study at any time without penalty or loss of benefits. You may also freely decline to answer any of the questions asked of you
4. The responses that you provide today will be kept completely confidential. At no time will your name or any other identifying information be associated with any of the data that you generate today. It will never be possible to identify you personally in any report of this research. Within these restrictions, results of the study will be made available to you upon request.
5. The risks associated with participation in this study are not greater than those ordinarily encountered in daily life, although you may feel mild discomfort at various stages of the experiment (e.g., boredom or fatigue). If you feel that you are distressed at any time while participating in this research, you should notify the researcher immediately. Your participation in this study does not guarantee any beneficial results. However, it will aid in your understanding of how psychological research is conducted as well as contribute to the general knowledge in the field.
6. If you become distressed as a result of your participation in this study, then you should contact an agency on-campus or in the surrounding community that may be able to provide services for you. A partial list of available resources is provided below.
 University of Southern Mississippi Counseling Center (601) 266-4829; Pine belt mental Healthcare (601) 544-4641; Pine Grove Recovery Center (800) 821-7399; Forrest General Psychology Services (601) 288-4900; Lifeway Counseling Service Incorporated (601) 258-3159; Behavioral Health Center (601) 268-5026; Hope Center (601) 264-0890
7. By signing your name below, you are indicating that you understand your participation is voluntary, that your responses will be kept confidential, and that you are at least 18 years of age

I voluntarily agree to participate in this study,

Participant Signature: _____

Date: _____

Investigator Signature: _____

Date: _____

Appendix B

Economic Recession Prime

Worst Economic Crisis Since '30s With No End in Sight

By MORGAN JAMESTON, Senior Times Writer

Five months ago Jonathan Pierce had a stable, well-paying job. Having earned a college degree, Jon was doing well at age 25. He even believed he was about to be promoted. Today, however, Jon is yet again standing in the dreary unemployment line downtown. "I didn't think this could happen to me," he mutters while shaking his head. "I have a college degree and I can't even get a job interview, let alone a job. I'm facing foreclosure on my house, and I just don't know where the money is going to come from."

This depressing scene is not unique. Unemployment lines are beginning to spread across the country. "The early numbers are staggering," notes Oliver Windsor, the head of the U.S. Economic Commission. And it's not just blue-collar jobs like construction and food service that are being cut. It's the white-collar jobs like management and office work that are being hit the hardest. According to Windsor, "the best-case scenario looks like a recession. The worst-case scenario is a depression similar to that in the 1930s." Unfortunately, there is little that the government can do to remedy the situation. As every economist knows, changing the interest rates might slow the bleeding, but it can't fix the underlying structural problems.

The impending economic crisis is only the beginning of the new reality faced by Americans and there is no end in sight. After decades of economic growth, experts agree that the U.S. is on the verge of an economic shift. "The economy of the 21st century is fundamentally different from that in the past," explains Dr. Patricia Wharton, chair of the panel for U.S. Economic Stability. "The sad truth is that this generation is certain to be the first generation to do worse than their parents—and their children will likely be even worse off. The housing bubbles, skyrocketing energy prices, a massive trade deficit, and the credit crisis only begin to scratch the surface of our economic problems."

The fact that younger Americans should expect to have little economic advancement is only part of the imminent economic disaster. Skyrocketing worldwide population growth and scarcity of natural resources are both working together to transform the U.S. economy. To understand how these factors are changing life for Americans, Oliver Windsor, one of 80 leading scientists who contributed to the government report, reminds us of the basics: "There are literally billions of people out there competing with each other. And these people are not just competing for jobs. The truth is that they're competing for food, water, and air."

The underlying fact is that our planet simply cannot support tens of billions of people. While it may be difficult for some to even imagine that the U.S. might one day be in poverty, the world in the 21st century is highly inter-connected. Things that happen in China, India, and Africa have tremendous consequences for what happens in the rest of the world. And as necessities like safe food, drinkable water, and breathable air become scarcer and expensive, the world as we know it will become a very different place.

Watching Jonathan Pierce wait in the unemployment line downtown, one can't help but be reminded of the Great Depression—a time in American history that most people only remember from their history classes. The images of the Depression are difficult to erase: Malnourished children begging for food, people standing in line for days just to get a slice of bread and a cup of soup, everyone struggling to feed themselves and their families. The sad truth for people like Jonathan Pierce and countless others is that losing a job is only the beginning. Tough times are ahead.

Appendix C

Control Prime

Bandish the Bland: The Glass Box Is So Last Century

By ERIC FELTON, Senior Times Writer

This week saw a building by famed modernist architect Ludwig Mies van der Rohe succumb to the wrecking ball, making room at the Illinois Institute of Technology for a commuter rail station. A few fevered bloggers complained, but the preservationists yawned. Perhaps that's because the building was a dumpy brick shed devoid of interest or import. Or perhaps it's because the Mies style doesn't seem endangered at the moment.

We're seeing a resurgence of mid-century modernism, from "Mad Men" fashions to sparse interiors displaying Le Corbusier sofas. But the trademark glass-and-steel boxes of modern architecture didn't need a comeback. They've never left: Cities continue to toss them up in all their stark, anonymous severity.

Will architects ever give us something new? Sure, we get some wild edifice-expressions, whether the crumpled-paper shapes of Frank Gehry or the off-kilter polyhedral of Rem Koolhaas. But even when today's architects escape the old box-on-stilts of the International Style, they stick to the one unwritten law of modern architecture: Thou Shalt Not Ornament.

Sleek surfaces of class, metal, concrete or stone can be broken up by structural geometry- Mies himself was in the habit of welding steel I-beams to the exterior of his buildings to delineate the framework underneath. But there's no room in the International Style or its many cookie-cutter cousins for the integrated decorations that, for countless years, and in countless cultures, were thought to be an essential part of buildings. No carved-stone swags or florid ironwork, no fussy moldings or extraneous curlicues, no bas-relief motifs or scrolls, no anthemion or acanthus. Homebuyers may look for the "period detail" that makes a house pleasing to the eye and spirit- it's a prime selling point in real-estate listings – but the glass-and-steel boys who dominate urban design remain devoted to a dogma that denounces such things as corrupt and impure.

It is only natural for styles to swing from one extreme to another, and after the riotous ticky-tack of high Victorian style you can't blame anyone for having wanted some clean, straight lines. Novelist and arbiter of taste Edith Wharton called for "clearing away bric-a-brac on the sound principle that "a small quantity of ornament, properly applied, will produce far more effect than ten times its amount used in the wrong way." The inventor of the skyscraper, Louis Sullivan, suggested in 1892 that it would be a good idea to take a break from ornament for a while in order to remember how to make "buildings well-formed and comely in the nude." But Sullivan didn't want to eliminate ornament altogether, he just wanted to get it under control and showed how to do it with the iron foliation around the first floors of Chicago's Carson Pirie Scott department store. By contrast, the radical modernists wanted to scrape structures clean of ornament altogether, like a landscaper who tames a wild, overgrown garden by paving it over.

And that's where we still are today. The postmodernists tried to reintroduce ornament of a sort- in the case of Philip Johnson's AT&T building, by sticking a Chippendale top on a midtown Manhattan skyscraper. But these were half-hearted, ironic gestures, too feeble to dislodge the anti-ornament aesthetic. It's hard to get the pendulum swinging back when it's stuck under all that raw concrete.

Appendix D

Product Images

Beauty:



Control:



Appendix E

Demographic Form

Please take a moment to answer the following demographic questions:

I am

1. Male
2. Female

My racial identity is

1. American Indian
2. Asian/Pacific Islander
3. Black, not of Hispanic origin
4. Hispanic
5. White, not of Hispanic origin
6. Other/Unknown

Please indicate your age in years

Press ENTER when you have typed your answer.

Did anything seem odd to you during this study?

What do you think this study was about?

Is there anything you think might have influenced your responses during this experiment (e.g. you're tired, you didn't pay attention)? This will not affect your credit, but it will help us better understand the results of the study.

Have you been in a similar experiment at any other time?

Appendix F

Adult SES Questionnaire

(1=*strongly disagree*; 7=*strongly agree*):

1. I have enough money to buy the things I want
2. I don't worry too much about paying my bills
3. I don't think I will have to worry about money too much in the future

Appendix G

Debriefing Form

Thank you for participating in this experiment. In this study we were interested in how aspects of the economy influence the kinds of products people are interested in purchasing. For example, Hill and colleagues (2012) found that exposing participants to recessionary cues (i.e., information related to a bad economy) decreased women's interest in purchasing non-beauty products (e.g., electronics, household items), but increased their interest in purchasing products that would increase their attractiveness to mates (e.g., designer jeans, cosmetics), particularly mates who possess significant personal resources, which they refer to as the 'Lipstick Effect.'

In the current study, we were interested in this lipstick effect would be reflected in certain aspects of visual attention and overt behavior. You were randomly assigned to read an article that would make salient the idea of economic recession or a control essay unrelated to the economy. We then asked you to complete a visual search task. We predicted that participants primed with economic recession would be faster to orient their attention towards beauty products as opposed to non-beauty products, compared to control prime participants. Such findings would demonstrate that the lipstick effect occurs at the level of automatic visual attention and has downstream consequences for discrete behavior.

We did not tell you that this study was about how economic recession cues influence attention and behavior toward beauty and non-beauty products because we wanted you to respond naturally to the experimental procedures. In order to see how people respond naturally, it was necessary not to reveal this aspect of the experiment prior to recording your responses. When people know about the purpose of some experiments ahead of time, they often cannot or will not behave as they normally would.

Due to the on-going nature of this research, we would like to ask for your cooperation in not revealing any details of this study to others (e.g. friends, classmates) who might eventually participate in this study. These details could affect the way they perform in this experiment, which would adversely affect the nature of our study. If someone does ask, you can just tell them that you were asked to participate in a study about product preferences, rather than providing specific details about the study.

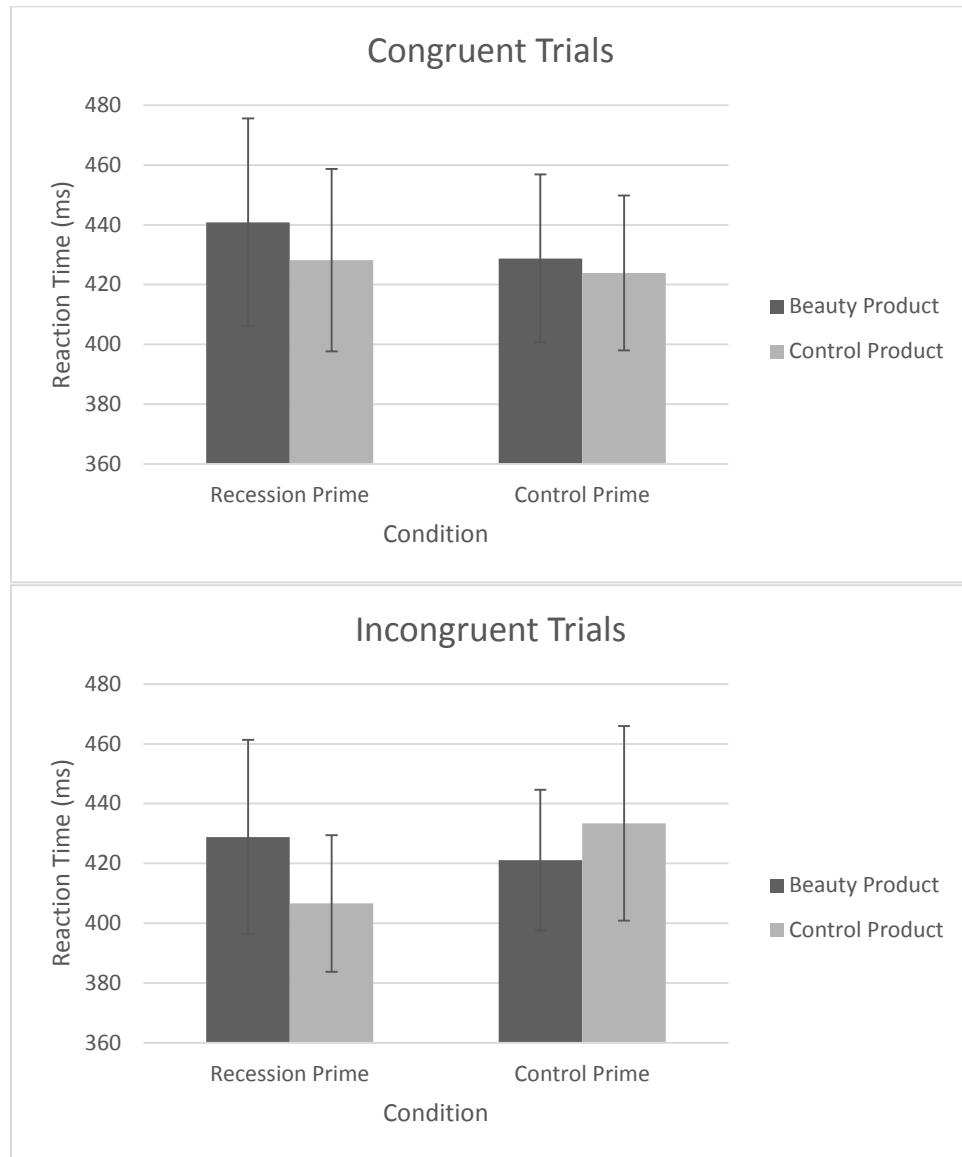
If any part of this experiment has been traumatic for you in any way, please feel free to inform the experimenter. If you have further questions, please contact the experimenter listed on your consent form (Dr. Donald Sacco; Donald.Sacco@usm.edu). Should you be interested in reading research related to this work, you can get more information from:

Fox, E., Russo, R., Bowles, R., & Dutton, K. (2001). Do threatening stimuli draw or hold visual attention in subclinical anxiety? *Journal of Experimental Psychology: General*, 130, 681-700.

Hill, S. E., Rodeheffer, C. D., Griskevicius, V., Durante, K., & White, A. E. (2012). Boosting beauty in an economic decline: mating, spending, and the lipstick effect. *Journal of Personality and Social Psychology*, 103, 275-291.

Appendix H

Figure 1: Mean Reaction Times (ms) for participants in the recession prime and control conditions across incongruent and congruent trials and beauty versus non beauty products (Error bars represent the standard error of the mean).



Appendix I

INSTITUTIONAL REVIEW BOARD

118 College Drive #5147 | Hattiesburg, MS 39406-0001

Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board**NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.

Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 14072109

PROJECT TITLE: The Lipstick Effect Revisited: Resource Scarcity, Mating and Product Preferences

PROJECT TYPE: New Project

RESEARCHER(S): Aaron Bermond

COLLEGE/DIVISION: College of Education and Psychology

DEPARTMENT: Psychology

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Expedited Review Approval

PERIOD OF APPROVAL: 07/25/2014 to 07/24/2015

Lawrence A. Hosman, Ph.D.
Institutional Review Board