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Sarah E. Hill, Christopher D. Rodeheffer, Vladas Griskevicius, Kristina Durante, and Andrew Edward White

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Boosting Beauty in an Economic Decline: Mating, Spending, and the Lipstick Effect

Sarah E. Hill and Christopher D. Rodeheffer
Texas Christian University

Vladas Griskevicius
University of Minnesota

Kristina Durante
University of Texas at San Antonio

Andrew Edward White
Arizona State University

Although consumer spending typically declines in economic recessions, some observers have noted that recessions appear to increase women's spending on beauty products—the so-called lipstick effect. Using both historical spending data and rigorous experiments, the authors examine how and why economic recessions influence women's consumer behavior. Findings revealed that recessionary cues—whether naturally occurring or experimentally primed—decreased desire for most products (e.g., electronics, household items). However, these cues consistently increased women's desire for products that increase attractiveness to mates—the first experimental demonstration of the lipstick effect. Additional studies show that this effect is driven by women's desire to attract mates with resources and depends on the perceived mate attraction function served by these products. In addition to showing how and why economic recessions influence women's desire for beauty products, this research provides novel insights into women's mating psychology, consumer behavior, and the relationship between the two.

Keywords: evolutionary psychology, mating, economic recessions, consumer behavior, attractiveness

The year 2007 began what has been considered by many economists to be the worst economic recession since the great depression (Business Wire News, 2009). This period has been marked by myriad workplace layoffs, home foreclosures, and an overall decline in economic activity (Bailey & Elliott, 2009). Consistent with previous recessionary periods, consumers in this economic downturn have downsized spending on everything from groceries to homes (Bohlen, Carlotti, & Mihas, 2010; Dibaji, Powers, & Keswani, 2010; Katona, 1974). For example, many people have traded their vacations for a “stay-cation,” choosing to vacation in the low-cost destination of their own home.

Although spending on most consumer products during the recent recession has predictably declined, one class of products is believed to have fared unusually well: beauty products (Allison & Martinez, 2010; Schaefer, 2008). For instance, sales figures from one of the world's biggest cosmetics companies—L'Oreal—showed that during 2008, a year when the rest of the economy was suffering record declines in sales, they experienced sales *growth* of 5.3% (Elliott, 2008). The notion that women may spend relatively more money on

attractiveness-enhancing products during times of economic recession has been dubbed by journalists as the *lipstick effect* (Nelson, 2001). The idea of a lipstick effect has been discussed in several recent economic downturns and is even believed to have occurred during the Great Depression, when sales of women's cosmetics products boomed unexpectedly (Koehn, 2001).

In the present research, we experimentally examine the idea of the lipstick effect. To understand how and why economic recessions might influence women's psychology and behavior, we draw on life history theory (Charnov, 1993; Roff, 1992; Stearns, 1992), models of human mating (Buss, 1988a; Kenrick & Keefe, 1992; Symons, 1979), and biological models of mating pool quality (Clutton-Brock, 2009; Cotton, Small, & Pomiankowski, 2006). These frameworks suggest that conditions of economic resource scarcity should prompt individuals to increase effort directed toward attracting mates, particularly for women. This means that despite dampening consumer interest in most classes of products, economic recession cues may lead women to have heightened interest in products that enhance their desirability to mates, thereby prompting the lipstick effect. By showing how and why economic recessions influence women's psychology, the present research provides novel links between economic conditions, women's mating psychology, and consumer behavior.

Economic Recessions and Life History Theory

Economic recessions are a ubiquitous feature of modern market economies. In the United States alone, there have been 23 economic recessions since the mid-1880s (National Bureau of Economic Research, 2011). At the aggregate economic level, recessions are marked by widespread decreases in consumer spending (Bohlen et al., 2010; Dibaji et al., 2010; Katona, 1974). Economic

Sarah E. Hill and Christopher D. Rodeheffer, Psychology Department, Texas Christian University; Vladas Griskevicius, Carlson School of Management, University of Minnesota; Kristina Durante, Department of Management, University of Texas at San Antonio; Andrew Edward White, Psychology Department, Arizona State University.

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Correspondence concerning this article should be addressed to Sarah E. Hill, Department of Psychology, Texas Christian University, Fort Worth, TX 76129. E-mail: s.e.hill@tcu.edu

declines can also have psychological consequences. For example, recent recessions have been linked to dwindling optimism among college students about their employment prospects (De Hauw & De Vos, 2010) and a decline in life satisfaction and well-being (Tausig & Fenwick, 1999).

Fluctuations in prosperity and resource availability are not strictly modern phenomena. Over the course of evolutionary time, our human ancestors regularly went through cycles of abundance and famine (Chakravarthy & Booth, 2004). To understand how organisms cope with resource-scarce ecologies, it is therefore useful to consider life history theory, which is a foundational framework in evolutionary ecology and is increasingly used in anthropology and developmental psychology (Chisholm, 1993; Roff, 2002; Stearns, 1992).

Life history theory asserts that all organisms, including humans, must make trade-offs between allocating resources either toward their own growth and development or toward more immediate reproduction. For example, throughout development, organisms must “choose” whether to allocate energy at a given point either toward seeking a mate or toward other tasks unrelated to immediate mating concerns (e.g., building embodied capital, growth, immune functioning). Life history theory contends that the fundamental trade-off between reproductive and somatic effort is influenced by ecological conditions (Kaplan & Gangestad, 2005). For example, research finds that individuals living in harsh environments marked by ecological resource scarcity and financial impoverishment tend to allocate effort toward more immediate reproduction than those living in more resource-abundant, financially secure environments (Belsky, Schlomer, & Ellis, 2011; Ellis, Figueredo, Brumbach, & Schlomer, 2009; Simpson, Griskevicius, Kuo, Sung, & Collins, 2012). Because economic recessions are also marked by dwindling resource access and poverty, economic recessions may therefore function like cues signaling environmental harshness. If so, life history theory suggests that economic recessions might lead people to allocate resources toward more immediate mating effort, including mate attraction.

Economic Recessions and Women’s Mating Pool Quality

In addition to prompting mating effort as suggested by life history theory, for women, economic recessions may simultaneously have important implications for the ferocity with which they must compete for mates. This is due to the important role that men’s resource access plays in women’s mate preferences. Whereas men’s reproductive success has been primarily dependent on their ability to gain sexual access to fertile women, women’s reproductive success has been strongly dependent on their ability to secure a partner able to invest resources in themselves and their offspring (Buss, 1994; Symons, 1979; Trivers, 1972). Accordingly, researchers have predicted that women should emphasize qualities related to a potential mate’s provisioning ability. These predictions have been supported in cultures from tribal Ecuador (Pillsworth, 2008) to metropolitan Japan (Dunn, Brinton, & Clark, 2010) and in contexts as diverse as personal ads (de Sousa Campos, Ota, & de Oliveira Siqueira, 2002) and folktales (Gottschall, Martin, Quish, & Rea, 2004).

Given the premium women place on a mate’s resource access, in the context of modern humans, the economic climate may play a key role in signaling the availability of high-quality men in a woman’s mating pool. Recessions are associated with higher un-

employment and minimal (or negative) returns on savings and investment. News of such conditions might therefore indicate to women an important shift in the mating ecology: An economic recession may signal that financially stable men are becoming scarce. Given that the number of people who have financial security declines in a recession, women—whose reproductive success has been critically dependent on a mate’s resource access—should both increase the preeminence of this preference and increase the effort they invest in attracting a mate who has them.

Much research in evolutionary biology supports this view. Across species, the strength of female mate preferences and the amount of effort allocated toward attracting specific males as mates tends to be lesser in magnitude when high-quality males are abundant (Clutton-Brock, 2009; Cotton et al., 2006). When there are many high-quality mates to choose from, females need only invest minimally in mating effort to attract a high-quality mate. Conversely, the strength of female preferences and mate attraction effort are expected to increase in magnitude as the availability of high-quality males decreases. When high-quality mates are scarce, there are greater benefits for females from discriminating between males and investing more effort in attracting specific, high-quality males as mates (Jennions & Petrie, 1997).

Men’s Mate Preferences and Women’s Attractiveness Enhancement

Taken together, the function-based insights offered by life history theory and biological models of mating pool quality predict that economic recessions may prompt women to expend more effort and resources on attracting desirable mates—financially secure men whose numbers become diminished in an economic decline. But what tactics do women use to attract desirable mates?

Men place a premium on physical attractiveness in their choice of romantic partners (Buss, 1988a; Buss, 1994; Kenrick & Keefe, 1992; Li, Bailey, Kenrick, & Linsenmeier, 2002; Symons, 1979; Trivers, 1972; Williams, 1975). Accordingly, the most frequent and effective tactic women use to attract or retain mates is enhancing their physical attractiveness (e.g., Buss, 1988a, 1988b; Buss & Shackelford, 1997; Durante, Griskevicius, Hill, Perilloux, & Li, 2011; Hill & Durante, 2009, 2011; Sabini & Silver, 2005; Schmitt & Buss, 2001). This is reflected in the ways that women spend their time and their money. Women spend significantly more time making themselves appear physically attractive compared with men (Aune & Aune, 1994; Daly, Hogg, Sacks, Smith, & Zimring, 1983), and women allocate a larger portion of their budgets to purchasing goods and services that enhance appearance (Hayhoe, Leach, Turner, Bruin, & Lawrence, 2000; G. F. Miller, 2009; Saad, 2007). Thus, increased mating effort for women should manifest itself as effort directed toward appearance enhancement.

Because economic recessions are reasoned to prompt women to expend more effort on mate attraction, is it possible that they may spur women to spend more on products that make them more attractive? We sought to examine this possibility. Guided by the evolutionary theories described above and the lore of the lipstick effect, we sought to examine whether economic recessions might prompt women to want to spend on products that are effective at making them more attractive to mates.

The Present Research

We present five studies in which we examine how economic recessions influence women's consumer preferences and mating psychology. On the basis of theory and research in evolutionary psychology and on the elusive idea of the lipstick effect, we made the following predictions: Whereas economic recessions should decrease spending on most products, economic recessions should increase women's spending on products that are perceived to effectively enhance their attractiveness to mates—the lipstick effect. We test this prediction and its associated mechanisms in a series of studies using multiple methods. In Study 1, we used real-world data to examine the relationship between fluctuations in economic conditions (unemployment) over the last 20 years and consumer spending priorities. In Study 2, we experimentally primed people with economic recession or control cues; men and women then indicated their desire for products that can and cannot enhance attractiveness. In Study 3, we tested the mediating mechanism of the lipstick effect. In Study 4, we tested the extent to which the price of beauty products influences the lipstick effect. Finally, in Study 5, we tested which women are most likely to exhibit the lipstick effect.

Study 1: Unemployment and Consumer Spending Priorities Over the Last 20 Years

In Study 1, we examined the relationship between economic conditions and consumer spending priorities. To do so, we accessed real-world data on monthly fluctuations in U.S. unemployment over the last 20 years to test how these fluctuations relate to the percentage of money that U.S. consumers allocate toward two classes of non-essential consumer products: (a) products that can be used to enhance attractiveness, such as clothing/accessories and personal care products/cosmetics, and (b) products that are generally not used to enhance attractiveness, such as furniture, electronics, and leisure/hobby products. We used changes in unemployment as the main economic indicator in this study because monthly data for this indicator were available and because unemployment is likely to be a particularly ecologically valid measure of actual economic hardship and harshness.

Consistent with previous research on spending in recessions (Bohlen et al., 2010; Dibaji et al., 2010; Katona, 1974), we predicted that the unemployment rate would be negatively related to relative consumer spending on products that are not used to enhance attractiveness. As unemployment goes up, people should allocate relatively less of their money toward purchasing items such as furniture, electronics, and leisure/hobby products. However, consistent with our theory and the lore of the lipstick effect, we predicted that the unemployment rate should be positively related to the amount that consumers allocate toward products that can enhance physical attractiveness. As unemployment goes up, people should spend relatively more money on clothing and accessories and on personal care and cosmetics.

Method

To assess whether the lipstick effect is supported by consumer spending priorities, data were first gathered from the Bureau of Labor Statistics on the average monthly unemployment rate in the United States for the last 20 years (Bureau of Labor Statistics, 2011). Data were then gathered for monthly retail spending from January 1992 to

April 2011 for five different product categories reported in the U.S. Census (U.S. Census Bureau, 2011). Two of these product categories—personal care and cosmetics products and clothing and accessories—can be used to enhance physical appearance. The other three categories—furniture, electronics, and leisure/hobby products—are unlikely to be used for enhancing appearance. Combining the unemployment data with the retail spending data provided 232 months—almost 20 years—of continuous data.

The percentage of total retail sales devoted to each product category was first calculated by dividing the total amount spent in each product category by the total amount spent across all product categories for that period. This provided a measure of *relative spending* for each of the five product categories, allowing us to capture consumption spending priorities in the face of budgetary constraints (Bertola & Pistaferri, 2005; Petev, Pistaferri, & Ekten, in press). Zero-order correlations between monthly unemployment rate and the percentage of money spent on each of the five product categories were then examined.

Results and Discussion

Results revealed negative correlations between unemployment and relative spending on furniture, $r(232) = -.79, p < .001$; electronics, $r(232) = -.52, p < .001$; and leisure/hobby products, $r(232) = -.21, p < .001$. As unemployment went up, people allocated smaller portions of their monthly spending budgets on these products. However, we found positive correlations between unemployment and relative spending on personal care/cosmetics products, $r(232) = .52, p < .001$, and on clothing/accessories, $r(232) = .20, p < .001$. As unemployment went up, people allocated larger portions of their monthly spending budgets on these products.¹

Taken together, the findings provide evidence that economic turbulence may lead to an important shift in consumer spending priorities. Specifically, these results demonstrate that a dire economic forecast may lead people to reallocate money that would normally be spent on products that cannot be used to enhance appearance, such as electronics and furniture, toward purchasing products that could enhance appearance, such as cosmetics and clothing. The specific pattern of findings provides initial evidence supporting the idea of the lipstick effect, showing that consumers may prioritize beauty during times of economic turmoil.

¹ We also examined the correlations between the unemployment rate and raw spending data. Despite raw spending being a much more conservative test of our hypothesis, the findings for raw spending were nevertheless consistent with the lipstick effect. When analyzing the raw spending data, there were again positive correlations between unemployment and spending on both personal care/cosmetics products, $r(232) = .30, p < .001$, and on clothing/accessories, $r(232) = .14, p = .04$. As unemployment went up, raw spending on products that could be used to enhance attractiveness also went up. For the other three categories of products that are unrelated to enhancing attractiveness, there was a marginally significant negative correlation between unemployment and spending, $r(232) = -.12, p = .076$. As unemployment went up, people spent less money on products not clearly related to enhancing attractiveness. Although not each of the three product categories reached conventional levels of significance when examining raw spending, all three were in the predicted negative direction: furniture, $r(232) = -.27, p < .001$; electronics, $r(232) = -.03, p = .71$; and leisure/hobby products, $r(232) = -.03, p = .72$. Thus, both the relative spending data and the raw spending data are suggestive of the lipstick effect.

Study 2: An Experimental Examination of the Lipstick Effect

The first study provided preliminary evidence for the lipstick effect using 20 years of real-world data. However, the correlational nature of the first study does not allow us to draw causal conclusions or determine whether the lipstick effect is driven by women, men, or perhaps both. Study 2 was designed to address these limitations by examining the lipstick effect experimentally. We first exposed people to economic recession cues (primes) by having men and women read either a news article about the turmoil of economic recession or a control article about modern architecture. People then indicated their desire to purchase products that could and could not enhance physical appearance.

Consistent with Study 1, we predicted that recession cues should decrease desire to purchase products that do not function to enhance appearance. However, we predicted that the same cues should increase desire to purchase products that can enhance appearance. Moreover, given that recessions decrease the quality of women's, but not men's, mating pool and because women are more likely than men to use attractiveness enhancement to attract mates (Buss, 1988a; Feingold, 1990, 1991; Li et al., 2002; Waynforth & Dunbar, 1995), we predicted that the desire to purchase appearance-enhancement products in response to a stark economic forecast would be driven by women.

Method

Participants. One hundred fifty-four university students (82 women, 72 men) served as participants in this study (79 in the economic recession condition and 75 in the control condition). Participants' ages ranged from 18 to 28 years ($M = 19.47$, $SD = 1.64$), and participation partially fulfilled a course requirement.

Design and procedure. The overall design of the study was a 2 (participant sex: women vs. men) \times 2 (prime condition: recession vs. control, between subjects) \times 2 (product type: beauty vs. control, within subjects) mixed factorial design. Participants came into a research laboratory in same-sex groups of two to six individuals ostensibly to participate in a study concerning the effectiveness of visualization on reading comprehension. Participants were seated at individually partitioned computer terminals running Qualtrics experimental software. After participants logged onto their respective computers, they provided informed consent and were randomly assigned via Qualtrics to either the economic recession or the neutral control condition. Participants in both conditions were asked to read a fictitious news article that they were told was taken from a recent issue of the *New York Times*. They were told to read the article carefully and to take their time to visualize the material as vividly as possible. They were told that they were doing this because they were in the "visual imagery condition" and would later be asked to recall details from the article.

After reading the article to which they were assigned, participants were told that they would be completing an unrelated brief survey on their product preferences. They were told that they would be taking this survey for a local marketing research company and that it would serve as a distractor until enough time had elapsed for their memory assessment. In actuality, the product preference survey included the dependent measures. Debriefing at

the end of the study revealed that none of the participants knew the true nature of the study.

Recession manipulation. In the recession condition, participants read a news article ostensibly from the *New York Times* about the recent economic downturn. The article was a modified version of an article appearing in the *Wall Street Journal* on September 18, 2008 ("Worst Economic Crisis Since '30s With No End in Sight"; Hilsenrath, Ng, & Paletta, 2008). The article described the growing harshness in the world economic markets, highlighting how growing unemployment and increased resource scarcity make the current recession similar to the Great Depression, but with no end in sight. In the control condition, participants read an article about current architecture based on an article that appeared in the December 4, 2009 issue of the *Wall Street Journal*. The article was chosen because it was similar in length and style to the recession article (recession: 622 words; control: 557 words). Each article was formatted to appear like a screenshot taken from nytimes.com.

To determine whether the economic recession article influenced people's perceptions about the number of people in their local environment who possess resources, but not other qualities that influence their desirability as a mate, a pretest was conducted with a separate sample of 23 male and female undergraduates (16 female). After reading either the recession or the control article, participants indicated to what extent the article made them think that there are fewer people in their immediate social environment who have (a) a good job, (b) steady income, and (c) a lot of money. Participants also indicated the degree to which the article made them think that there are fewer people in their immediate social environment who (d) are physically attractive, (e) have a sexy body, and (f) have a nice-looking face. Responses were provided on 7-point scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

As expected, the recession article led people to perceive that there are fewer people in their local environment who have good jobs ($M_{recession} = 5.82$, $SD = 0.60$; $M_{control} = 2.08$, $SD = 1.08$), $F(1, 21) = 101.56$, $p < .001$, $d = 4.28$; a steady income ($M_{recession} = 5.55$, $SD = 1.13$; $M_{control} = 2.50$, $SD = 1.57$), $F(1, 21) = 28.14$, $p < .001$, $d = 2.23$; and a lot of money ($M_{recession} = 4.73$, $SD = 1.74$; $M_{control} = 2.58$, $SD = 1.88$), $F(1, 21) = 8.02$, $p = .01$, $d = 1.19$. However, the two articles did not alter people's perceptions of the numbers of people who are physically attractive ($p = .35$), have a sexy body ($p = .45$), or have a nice face ($p = .35$). Thus, economic recession cues led people to perceive that there are fewer people who are financially secure.

Products. Participants indicated their desire to purchase six products. Three of the products were chosen specifically because they can be used to enhance physical appearance. Because men and women tend to use somewhat different products to enhance their physical attractiveness (e.g., men generally do not wear lipstick or dresses), men and women rated gender-appropriate products. The three attractiveness-enhancing products were (a) form-fitting jeans, (b) form-fitting black dress (women) / form-fitting polo shirt (men), and (c) lipstick (women) / men's facial cream (men). The other three products served as control products. The control products were similar in price to the first set of products, but they do not function to enhance physical attractiveness. These products were (a) wireless computer mouse, (b) stapler, and (c) headphones. A color photograph of each product was

displayed one at a time with a caption below with the product's description (e.g., "lipstick").

Preratings of the six products by a separate sample of 44 undergraduates (30 women) showed that the three beauty products were perceived as being much more likely to be used to increase attractiveness to mates compared with the control products. This effect was found both for men's and women's beauty products ($M_{Men} = 5.91, SD = 0.91; M_{Women} = 6.18, SD = 0.69$) compared with control products ($M = 1.71, SD = 1.12$): men, $F(1, 43) = 334.71, p < .001$; women, $F(1, 43) = 403.29, p < .001$. Participants saw each product one at a time in randomized order. For each product, participants indicated how much they agreed with the statement "I would like to purchase this item" on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Results

We first created a composite variable for each of the two product types—appearance enhancement ($\alpha = .82$) and control ($\alpha = .71$)—by averaging participants' responses across products within each product category. We then performed a mixed-model analysis of variance (ANOVA) wherein participant sex and prime condition were between-subjects factors and product type was a within-subjects factor. As predicted, the results revealed a three-way interaction between sex, prime condition, and product type, $F(1, 150) = 9.56, p = .002$. To test our specific predictions, we next conducted a series of 2 (prime condition) \times 2 (product type) mixed model ANOVAs within each sex.

For men, the results revealed no main effect of product type on purchasing desires, nor did condition interact with product type on this measure ($ps > .39$). There was, however, a significant main effect of priming condition on desire to purchase products of either type. Consistent with the notion that spending generally decreases during economic recessions, men in the recession condition were less interested in purchasing either type of product than men in the control condition ($M_{recession} = 4.07, SD = 1.24; M_{control} = 4.51, SD = 1.17$), $F(1, 70) = 3.91, p = .05, d = 0.36$ (see Figure 1).

For women, results revealed a significant interaction between priming condition and product type, $F(1, 80) = 33.50, p < .001$. Consistent with the findings for men, women in the recession condition reported a significantly diminished desire to purchase products that do not enhance attractiveness compared with women in the control condition ($M_{recession} = 3.47, SD = 0.92; M_{control} = 3.98, SD = 0.96$), $F(1, 80) = 5.95, p = .02, d = 0.54$. However, the economic recession prime had a very different effect on women's desire for products that could augment beauty. As predicted, women in the recession condition reported a significantly greater desire to purchase products that could enhance appearance compared with women in the control condition ($M_{recession} = 6.19, SD = 0.97; M_{control} = 4.97, SD = 1.60$), $F(1, 80) = 17.76, p < .001, d = 0.92$ (see Figure 1).

Discussion

Findings from Study 2 provided the first experimental evidence of the lipstick effect—the notion that economic recessions increase women's desire to purchase beauty products. When men and women read a news article about a recent economic recession, they had less desire to purchase consumer products unrelated to physical appearance. This decrease is consistent with patterns of consumer behavior in recessionary periods when people generally downsize spending (e.g., Bohlen et al., 2010; Dibaji et al., 2010; Katona, 1974). However, there was an important exception to this general decrease. When women were primed with cues to economic recession, they increased their desire to purchase products that could enhance appearance, including lipstick. This experimental finding is consistent with the real-world consumer spending findings in Study 1, which showed that increases in unemployment are related to increases in relative spending on products that can enhance appearance. The experimental findings from Study 2 suggest that the real-world findings from Study 1 are likely to be driven by female rather than male consumers.

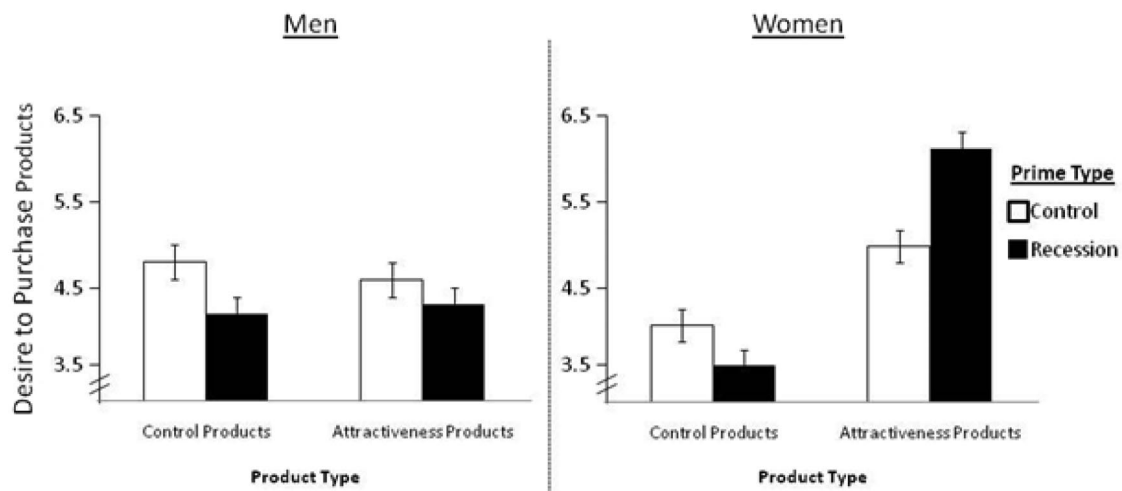


Figure 1. Desire to purchase products that can and cannot enhance attractiveness to mates as a function of economic recession prime and participant sex (Study 2). Error bars reflect standard error of the mean.

Study 3: Economic Recessions and Women's Mate Preferences

Study 3 had two goals. First, to ensure the robustness of the experimental findings in Study 2, we sought to conceptually replicate the lipstick effect using a different methodology to prime economic recession—a photo slideshow. Second, we tested a potential mediator of the relationship between economic recessions and women's desire for attractiveness-enhancing products.

As discussed earlier, the number of financially secure individuals declines substantially in periods of recession. Indeed, the pretest findings in Study 2 showed that women believe that there are fewer available men with resources after undergoing the economic recession prime. Given the important role that men's resource access has played in determining women's reproductive outcomes over evolutionary time, recessionary periods do not simply diminish the number of potential mates who have access to wealth; they also increase the benefits available to women from discriminating among men on this quality. Across species of sexually reproducing organisms, one of the primary predictors of the benefits available to females from discriminating among males on a fitness-relevant dimension (i.e., expressing a strong preference for a trait) is the availability of males possessing the trait (Andersson, 2004, 2005; Clutton-Brock, 2009). The decreased supply of men with resource access typical of recessionary periods should therefore (a) increase the priority that women place on a mate's resource access and, accordingly, (b) increase women's effort toward attracting mates who have resources. Therefore, in Study 3, we tested whether the strength of women's preference for financial security in a mate would mediate the relationship of how economic recession cues influence women's desire for attractiveness-enhancing products. Because the lipstick effect pertains to women, and because Study 2 revealed that economic recession cues do not generally lead men to want to enhance appearance, we focus specifically on women for the remainder of the present article.

Method

Participants. Seventy-six unmarried female university students served as participants in this study (36 in the recession condition and 40 in the control condition). Participants' ages ranged from 18 to 24 years ($M = 19.66$, $SD = 1.29$), and participation partially fulfilled a course requirement.

Design and procedure. The overall design of the study was a 2 (prime condition: recession vs. control, between subjects) \times 2 (product type: attractiveness enhancing vs. control, within-subjects) mixed factorial design.

Recession manipulation. Economic recession was primed by having participants view a slideshow that ostensibly summarized a news story. The slideshow was titled, "The New Economics of the 21st Century: A Harsh and Unpredictable World." This slideshow portrayed photos of the current state of the U.S. economy, including photos of unemployment lines, home foreclosure signs, and empty office buildings. In the control condition, participants viewed a slideshow titled, "Making the Grade: No Longer a Walk in the Park." This slideshow portrayed photos of students working to meet stringent academic requirements imposed by college administrators. These slides were chosen for the control condition

because they are expected to produce similar levels of anxiety as the economic recession slideshow, but are unrelated to economic indicators. Participants viewed each slide for 15 s.

A pretest was conducted to determine whether the economic recession slideshow influenced women's desire to make themselves attractive to mates and whether the amount of uncertainty the manipulation elicited differed from the control condition. To this end, a separate sample of 58 women (27 in the recession condition) were randomly assigned via Qualtrics to view either the recession or the control prime. After undergoing the priming procedure, participants indicated how much they agreed with the following statements: (a) "I want members of the opposite sex to think that I am pretty"; (b) "It is important to me that I look good"; and (c) "I care how attractive I look." Participants also indicated the degree to which they felt that (d) the future is out of their hands, (e) the world is an unpredictable place, and (f) it is uncertain what tomorrow may bring. Responses were provided on 7-point scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A prediction was made that exposure to the recession slideshow, compared with the control slideshow, would lead women to report being more concerned with their physical attractiveness but yield no differences in their general feelings of uncertainty.

As predicted, the recession slideshow led women to report wanting members of the opposite sex to think that they are pretty ($M_{recession} = 6.26$, $SD = 0.71$; $M_{control} = 5.74$, $SD = 0.68$), $F(1, 56) = 7.98$, $p = .007$, $d = 0.75$; to report that it is important to look good ($M_{recession} = 5.70$, $SD = 0.87$; $M_{control} = 5.19$, $SD = 1.08$), $F(1, 56) = 3.86$, $p = .05$, $d = 1.54$; and to report caring more about how attractive they look ($M_{recession} = 5.70$, $SD = 1.20$; $M_{control} = 5.03$, $SD = 1.33$), $F(1, 56) = 4.02$, $p = .05$, $d = 1.19$. However, the two primes did not differ in the degree to which they made women feel that the future is out of their hands ($p = .67$), that the world is an unpredictable place ($p = .49$), or that they feel uncertain about what tomorrow may bring ($p = .34$). Thus, economic recession cues led women to be more concerned with looking physically attractive compared with the control prime, but the two did not elicit differing levels of uncertainty.

Products. Participants indicated their desire to purchase a total of eight products. As in Study 2, half of the products were attractiveness enhancing, and the other half of the products did not function to boost physical attractiveness. The attractiveness-enhancement products were (a) tank top, (b) fitted jeans, (c) make-up, and (d) perfume. The other four products were (e) Mp3 player, (f) laptop computer, (g) dish soap, and (h) laundry detergent. Pretesting with a separate sample of 30 women indicated that the former set of products were more likely to be used to attract a mate compared with the latter three products ($M = 5.92$, $SD = 0.72$; $M = 2.46$, $SD = 1.24$), $F(1, 28) = 201.05$, $p < .001$, $d = 3.41$. As with Study 2, participants indicated their interest in purchasing each product by indicating their agreement with the statement "I would like to buy this product" on a -7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Preference for resources. The extent to which women desire financial security in a relationship partner was assessed by asking participants to indicate how much they agree or disagree with the following two statements: (a) A potential marriage partner's financial standing (how much money they have) is important to me and (b) It is absolutely necessary for a potential marriage partner to be

financially stable. Ratings were made on 7-point scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Changes in affect/arousal. To ensure that the predicted effects in the study are not driven by generalized changes in affect or arousal, after completing the dependent measures, participants completed the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item self-report measure of positive and negative affect and arousal. This scale was chosen because of its demonstrated reliability and validity (e.g., Crawford & Henry, 2004) and because its items measure both affect (e.g., ashamed, inspired) and arousal (e.g., jittery, excited).

Results

Affect/arousal. We first created a composite variable each for positive ($\alpha = .89$) and negative ($\alpha = .79$) affect/arousal by averaging participants' responses to questions within each category. Next, we tested whether groups differed from one another on either of these measures so that we could control for such differences if necessary when testing our predictions. To this end, we ran a multivariate ANOVA wherein condition was the predictor and composite positive and negative affect scores were entered as dependent measures. The results of our analyses indicated that there were no differences in either positive or negative affect/arousal based on priming condition ($ps \geq .26$). Positive and negative affect were thus not included as covariates in any of the models that follow.

Product desirability. We next created a composite variable for the attractiveness products ($\alpha = .80$) and a composite variable for the nonattractiveness products ($\alpha = .67$) by averaging participants' responses across products within each product category. We then performed a 2×2 mixed model ANOVA in which prime condition was the between-subjects factor and product type was the within-subjects factor. This analysis revealed a significant interaction between prime condition and product type, $F(1, 74) = 15.54, p < .001$. We next tested the specific predictions of the study.

Consistent with Study 2, women in the recession condition reported a significantly diminished desire to purchase products that could not enhance attractiveness compared with the control group ($M_{recession} = 3.56, SD = 1.25; M_{control} = 4.31, SD = 1.37$), $F(1, 74) = 6.28, p = .01, d = .57$ (see Figure 2). When products could not enhance the owner's physical attractiveness, cues to an economic recession decreased women's desire to purchase them. In contrast, women in the recession condition had a significantly greater desire to purchase products that could enhance their attractiveness compared with women in the control condition ($M_{recession} = 5.35, SD = 1.07; M_{control} = 4.75, SD = 1.18$), $F(1, 74) = 5.30, p = .02, d = 0.53$ (see Figure 2). Consistent with results from Study 2, when products could enhance the owner's physical attractiveness, cues to an economic recession once again increased women's desire to purchase such products.

Mate preferences. We next examined whether recession cues increase the emphasis that women place on resource access in their mates. To test this possibility, we first created a composite measure of women's preference for resources by averaging ratings across the two resource preference measures. Next, we entered this preference score as the dependent measure into a univariate

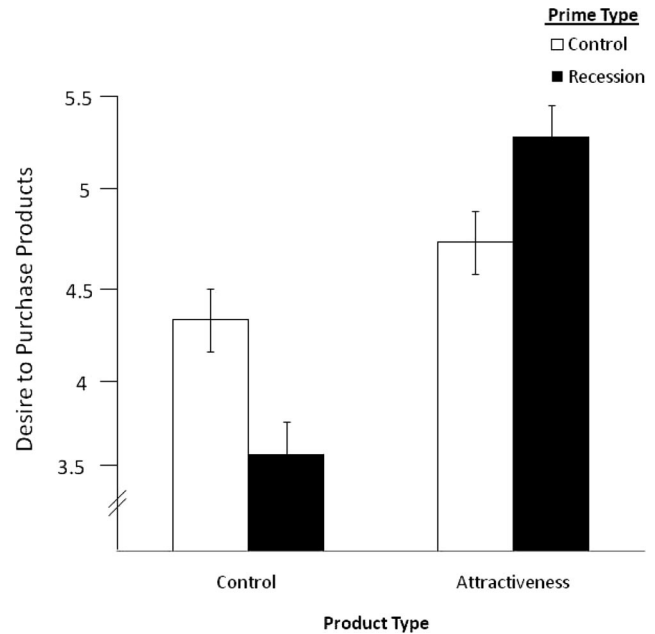


Figure 2. Women's desire to purchase products that can or cannot enhance attractiveness to mates as a function of economic recession prime (Study 3). Error bars reflect standard error of the mean.

ANOVA with condition as a predictor. As predicted, women in the economic recession condition placed a significantly greater emphasis on a potential relationship partner's access to financial resources than did women in the control condition ($M_{recession} = 5.36, SD = 1.00; M_{control} = 4.84, SD = 1.36$), $F(1, 73) = 4.74, p = .04, d = 0.44$.

Mediation analysis. We predicted that women's heightened desire to purchase products that can enhance attractiveness in the face of a bleak economic forecast would be mediated by a heightened preference for mates with resources. To test this hypothesis, we used Preacher and Hayes' (2008) bootstrapping procedure and corresponding SPSS macro to test for a significant indirect effect of economic recession on desire to buy beauty products via women's preference for mates with resources. The bootstrapping procedure was chosen to test for the significance of our mediation model in lieu of the Baron and Kenny (1986) procedure or the Sobel test because the bootstrap procedure allows to test for indirect effects without the imposition of sample size and distributional assumptions required for Sobel and Baron and Kenny. Furthermore, it allows us to detect significant mediation even in cases in which multiple mediators may play a role in the path between the predictor and the dependent measure, as is likely in the relationship between recession cues and women's desire for beauty products (see Hayes, 2009; Rucker, Preacher, Tormala, & Petty, 2011). Five thousand bootstrap resamples were performed.

The results of our analysis revealed evidence of a significant indirect effect of priming condition on women's desire to buy beauty products via their desire for mates with resources ($\beta = .16, SE = .09, 95\% \text{ CI } [.02, .39]$). Figure 3 presents a graphical depiction of the model, along with the statistics measuring the significance of each predictive pathway. Consistent with the results presented above, priming condition significantly predicted

Indirect Effect of Condition on Desire to Buy Beauty Products, $\theta = .16$ ($SE: .09$), 95% CI [.02, .39].

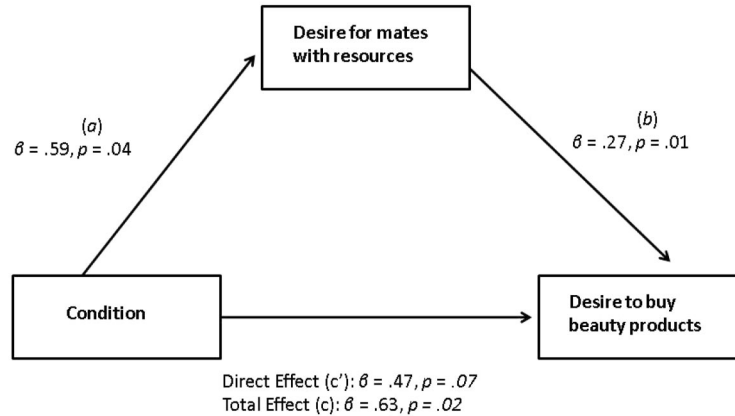


Figure 3. Mediation model for Study 3. All path coefficients represent standardized regression weights. The direct effect coefficient represents the effect of condition on women's desire for beauty products after controlling for the mediating influence of preference for mates with resources (95% CI [.02, .39]).

the emphasis women placed on a mate's resource access (*a* path) ($\beta = .59$, $SE = .28$, $t(72) = 2.12$, $p = .04$). Furthermore, consistent with the logic of our hypothesis, the more emphasis women place on a mate's resource holdings, the more interested they are in buying products that enhance attractiveness (*b* path) ($\beta = .27$, $SE = .11$, $t(72) = 2.49$, $p = .01$). Moreover, although the coefficient representing the indirect effect of prime condition on women's desire to buy beauty products was statistically significant (*c* path) ($\beta = .63$, $SE = .26$, $t(72) = 2.38$, $p = .02$), the coefficient representing the direct effect of condition after controlling for the mediating influence of women's desire for mates with resources was not (*c'* path) ($\beta = .47$, $SE = .26$, $t(72) = 1.79$, $p = .07$). These results provide evidence that changes in women's desire for mates with resources fully mediate women's increased desire for beauty products (confidence interval does not include 0; CI [.02, .39]). As expected, we found no such mediation effect for women's interest in purchasing control products (test for indirect effects, $p = .50$).

Discussion

Despite varying the economic recession manipulation, we found in Study 3 continuing support for the lipstick effect—the notion that women seek beauty products in economic recessions. Whereas cues to economic recession again decreased women's desire to purchase products unrelated to beauty, the same cues once again increased women's interest in purchasing attractiveness-enhancement products. In addition, we found evidence in Study 3 of a significant indirect effect on priming condition on women's desire to buy beauty products via their preference for mates with resources. Economic recession cues increased women's desire for a relationship partner with financial security, which then mediated women's heightened desire to purchase beauty products in response to recessionary cues. The results of our analysis provided evidence for full mediation; however, it is important to point out that the direct effect between priming condition and women's desire for beauty products was still marginally significant ($p =$

.07) after controlling for women's heightened desire for resources. Therefore, it is likely that there may be other psychological factors that also play a mediating role in the relationship between economic uncertainty and women's desire to buy beauty products. Nonetheless, these findings suggest that the lipstick effect emerges at least in part from a strategic shift in modern women's consumer behaviors guided by the desire to attract financially secure mates in conditions when such mates are rarified.

Study 4: Luxury Beauty Products Versus Inexpensive Indulgences

Study 4 was designed with two goals in mind. First, we sought to rule out a potential alternative explanation of the lipstick effect. Journalists reporting on the lipstick effect have often speculated that this phenomenon reflects women in recessions being drawn to cheap indulgences, such as lipstick, rather than expensive indulgences, such as laptop computers. However, we contend that recessions should lead women to want to purchase products that make them most desirable to mates, regardless of the product's cost. That is, if women believe that an expensive luxury product will make them more desirable to mates, recession cues should increase women's desire for that product. However, if women do not believe that a given product is very effective at enhancing attractiveness, economic recessions should not increase women's desire for that product.

To this end, we again primed women with recession cues and measured their interest in purchasing luxury attractiveness-enhancement products (e.g., designer jeans) and two classes of inexpensive control products: low-cost indulgences that cannot be used to enhance attractiveness (e.g., coffee) and discount brand versions of the attractiveness-enhancement products (e.g., Faded Glory brand jeans from WalMart). We predicted to replicate the effects from Studies 1–3, with women reporting *less* interest in purchasing items that cannot be used to enhance attractiveness in response to recession cues, but *more* interest in purchasing items that can be used to make them appear more attractive to mates. Moreover, given that luxury brand products are believed to work

better than comparable discount products (Dodds, 1995, 1996; Dodds, Monroe, & Grewal, 1991; Lichtenstein, Ridgway, & Netemeyer, 1993), we predicted that the lipstick effect would not be exhibited with cheap beauty products despite their being a less expensive alternative to general appearance maintenance goals. That is, recessions should enhance desire for beauty products perceived as most effective at enhancing desirability to mates, but recession should not enhance desire for beauty products that are perceived as being less effective for this goal.

The second goal of Study 4 was to rule out an alternative hypothesis derived from social roles theory (see Eagly & Wood, 1999)—specifically, that the lipstick effect may reflect women's greater resource need in a recession. On this view, because resources tend to be controlled by men, economic recessions should prompt women to attract wealthy mates specifically as a means to obtaining these rarified resources. In contrast, our evolutionary model predicts that economic resource scarcity should lead women to invest more effort in mate attraction effort because such conditions heighten reproductive goal immediacy and signal diminished access to high-quality mates, both of which prompt greater mate attraction efforts. We therefore sought to rule out this alternative hypothesis by testing the effect of women's current resource need on the strength of the lipstick effect.

From a social roles perspective, which would predict that the lipstick effect reflects women's increased resource needs in a recession, women's own resource access (e.g., her socioeconomic status [SES]) should be the driver of the lipstick effect. That is, the effect should be driven primarily by lower SES women, whose resource need is greatest. In contrast, our evolutionary model predicts that uncertain economic climates should lead women to heighten mate attraction effort—and to do so irrespective of their own resource need. Thus, in Study 4, we tested whether the lipstick effect is driven primarily by women with relatively little access to resources (as would be predicted from a social roles perspective) or whether the lipstick effect is driven by women both who do and do not have access to resources (as predicted by an evolutionary perspective).

Method

Participants. Sixty-four unmarried female university students served as participants in this study (31 in the recession condition and 33 in the control condition). Participants' ages ranged from 18 to 20 years ($M = 18.34$, $SD = 0.54$), and participation partially fulfilled a course requirement.

Design and procedure. The overall design of the study was a 2 (prime condition: recession vs. control, between subjects) \times 3 (product type: pricey attractiveness-enhancement products, inexpensive attractiveness-enhancement products, and inexpensive control products, within subjects) mixed factorial design. The procedure and cover story were the same as those used in Study 3. A suspicion probe performed at the end of the study revealed that none of the participants knew the true nature of the experiment.

Products. Participants viewed a total of nine labeled, color photographs of consumer products that are popular with college students. Three of the items were luxury brand products that can be used to increase attractiveness to mates (Coach perfume, Nordstrom dress, Seven jeans), three were discount brand versions of these attractiveness-enhancement products (Celine Dion perfume, WalMart dress, Faded Glory jeans), and three were low-cost

indulgences that cannot be used to increase attractiveness to mates (Starbucks coffee, SIGG travel mug, colored BIC pens).

To ensure that participants would perceive the luxury attractiveness-enhancement products as being (a) more expensive and as being (b) better at increasing attractiveness to mates compared with either low-cost alternative, a pilot study was first conducted on a separate sample of 30 female university students ($M_{age} = 18.33$, $SD = 0.84$). Participants viewed each product stimulus and were asked (a) "How expensive is this product?" (where 1 = *very inexpensive* and 7 = *very expensive*). Participants were also asked to indicate their agreement to the following three statements about the products' ability to make them more attractive to mates: (b) "This product would make me more desirable to the opposite sex"; (c) "This product would make me attractive to men"; and (d) "This product would help me attract mates" (where 1 = *strongly disagree* and 7 = *strongly agree*). A composite variable was first created by averaging participants' ratings of the three mate attraction items for each product category (luxury beauty products: $\alpha = .92$, discount beauty products: $\alpha = .95$, control products: $\alpha = .99$).

Repeated measures ANOVAs were then conducted on each of the two measures. Results verified that participants perceived the luxury brand items as being significantly more expensive ($M_{luxury} = 5.49$, $SD = 0.76$) than either the inexpensive attractiveness-enhancement ($M_{discount} = 2.70$, $SD = 0.58$), $F(1, 29) = 364.75$, $p < .001$, $d = 4.13$, or control products ($M_{control} = 3.01$, $SD = 0.86$), $F(1, 41) = 219.14$, $p < .001$, $d = 3.06$. Participants also perceived the luxury products as being significantly more likely to make them more attractive to mates ($M_{luxury} = 4.49$, $SD = 0.89$) compared with discount beauty products ($M_{discount} = 3.39$, $SD = 0.66$), $F(1, 28) = 30.51$, $p < .001$, and the control products ($M_{control} = 2.12$, $SD = 1.18$), $F(1, 26) = 70.93$, $p < .001$. Thus, the expensive attractiveness-enhancing products were seen as being significantly better at enhancing attractiveness to attract mates than the inexpensive products in the same category.

As in Studies 2 and 3, participants indicated their interest in purchasing each product by indicating their agreement with the statement: I would like to buy this product on a -7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Individual differences in women's resource access. Women's current access to resources was measured by asking women to indicate how much they agree/disagree with the following statements (where 1 = *strongly disagree* and 7 = *strongly agree*): (a) "My family has enough money for the things that we need"; (b) "I have never had to worry about having enough money for the things that I need"; (c) "I worry about money" (reverse scored); they were also asked to respond to the following: (d) "Which of the following best describes you/your parents' socioeconomic status (SES)" (where 1 = *Poor* and 7 = *Wealthy*). These four items were averaged into a resource access composite ($\alpha = .71$).²

² Descriptive statistics for women's SES (rated on 7-point scales wherein higher scores reflect higher access to wealth): $M = 5.24$, $SD = 0.98$ (range = 1.75–6.75).

Results

Desire to purchase products. We first performed a 2×3 mixed model ANOVA in which prime condition was the between-subjects factor and product type was the within-subjects factor. This analysis revealed a significant interaction between prime condition and product type, $F(2, 61) = 3.78, p = .03$. We next tested the specific predictions of the study.

Consistent with the results of Studies 2 and 3, women in the recession condition reported a diminished desire to purchase inexpensive indulgences that could not be used to enhance attractiveness to mates ($M_{recession} = 2.86, SD = 1.10; M_{control} = 3.46, SD = 1.41$), $F(1, 62) = 3.57, p = .06, d = 0.47$ (see Figure 4). When products could not enhance the owner's physical attractiveness, cues to economic recession again decreased women's desire to purchase them.

Whereas some have speculated that the lipstick effect may be related to women seeking inexpensive beauty products, we predicted that the lipstick effect should be related to seeking products that are more effective at enhancing attractiveness, even if such products cost more. Consistent with our prediction, women in the recession condition had a significantly greater desire to purchase expensive brand-name products that could be used to enhance their attractiveness compared with women in the control condition ($M_{recession} = 5.86, SD = 0.86; M_{control} = 5.18, SD = 1.08$), $F(1, 62) = 7.70, p = .007, d = 0.70$. However, recessions did not increase desire for discount brand beauty products that were seen as significantly less effective at enhancing beauty ($M_{recession} = 2.77, SD = 0.81; M_{control} = 3.06, SD = 0.91$), $F(1, 62) = 1.74, p = .019, d = 0.37$ (see Figure 4). These findings suggest that the lipstick effect is unlikely to be driven by women reallocating their spending from expensive to inexpensive indulgences. Instead, our findings suggest that the lipstick effect reflects a strategic spending

shift by women toward products that are perceived as particularly effective at enhancing attractiveness in mating.

Women's own resource access and the lipstick effect. We next examined whether women's own access to resources interacts with priming condition to moderate the lipstick effect. To test this possibility, we used multiple regression wherein prime condition (dummy coded) and SES (centered) were entered simultaneously as predictors in the first step, followed by the two-way interaction in the second step (see Aiken & West, 1991). We then ran regression models for each of the three product categories. Results revealed that women's own access to resources did not itself predict interest in purchasing any of the presented categories of products (all $ps \geq .69$), nor did it interact with the prime to influence women's interest in purchasing any of the products (all $ps \geq .38$). These results indicate that the lipstick effect is not driven specifically by women lacking access to resources of their own.

Discussion

In Study 4, we found continuing support for the lipstick effect—the notion that women desire beauty products in times of economic turmoil. As in Studies 2 and 3, recessionary cues were found to decrease women's desire to purchase items unrelated to beauty—low-cost indulgences such as coffee. However, recession cues increased women's desire for products that could make them more attractive to mates, despite the significantly greater expense of such products. Importantly, recession cues did not increase desire for discount brand beauty products, which were perceived as being less effective at enhancing attractiveness to mates. These results detract from the possibility that the lipstick effect reflects a general spending shift wherein women choose to buy inexpensive indulgences in the place of more expensive ones. Instead, the findings suggest that the lipstick effect reflects a strategic spending shift toward products that women believe will make them more attractive to mates.

Study 4 also provided evidence that the lipstick effect is not dependent on women's own resource need, as would be predicted by social roles theory. Instead, consistent with our model based on theories in evolutionary psychology, a robust lipstick effect was found in women across levels of SES. It is important to point out that the participants in Study 4 were college students and, as such, largely from middle-class backgrounds (see Footnote 2). The socioeconomic homogeneity of our sample would therefore make it more difficult to detect differences among women based on socioeconomic need if such differences existed. Nevertheless, our sample contained a substantial number of participants who were below the midpoint on our SES measure, including multiple individuals who were at the lowest point of our SES measure. Moreover, the variability in SES among women in our sample is comparable to that found in samples from other research that has evidenced SES-based moderation (see, e.g., Griskevicius, Delton, Robertson, & Tybur, 2011; Griskevicius, Tybur, Delton, & Robertson, 2011; Hill, Rodeheffer, DelPriore, & Butterfield, 2012). Furthermore, that each of our studies revealed evidence of a robust lipstick effect, despite the fact that many of the women in our sample came from backgrounds implying low resource need, indicates additional evidence that the lipstick effect does not emerge exclusively in response to objective resource need. These results provide

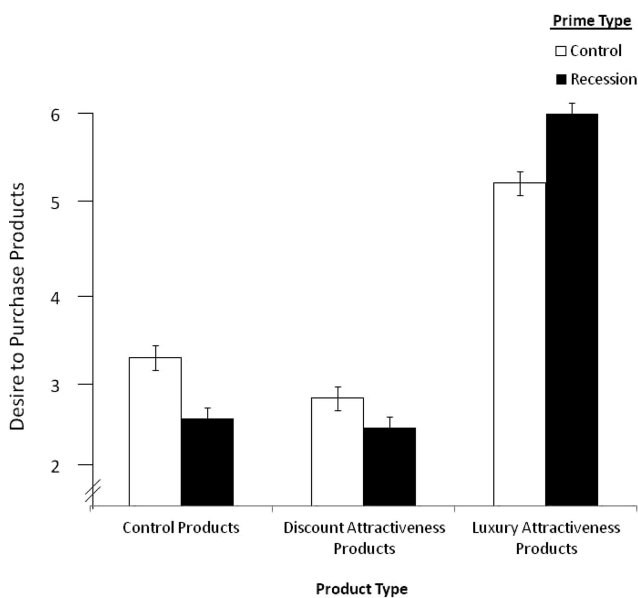


Figure 4. The effect of economic recession cues on women's desire to purchase luxury brand beauty products, discount beauty products, and inexpensive products unrelated to attractiveness (Study 4). Error bars reflect standard error of the mean.

support for the idea that social roles, by themselves, are unlikely to provide a complete explanation for the lipstick effect.

Study 5: Product Advertising Slogans

In the experiments presented thus far, the mate attraction and control products differed in multiple ways (e.g., a laptop computer is very different than lipstick). Accordingly, we cannot infer that recession cues increase women's interest in buying beauty products specifically because women believe that these products will make them more attractive to mates. It is still possible, for example, that recessions may prompt women to want to splurge on products that they desire to have in the first place. We designed Study 5 to redress this gap by seeking to conceptually replicate and extend the key findings from the first four studies by experimentally isolating the effect that a woman's beliefs about a product's mate attraction capabilities has on the lipstick effect. We therefore directly manipulated participants' perceptions of product function by presenting participants with two equally desirable versions of the same three products—jeans, high-heeled boots, and perfume—that were then given a slogan promoting either a mate attraction or a control function.

Research indicates that advertising slogans increase peoples' desire for a product only when the function implied by the slogan is consistent with a person's existing motivations and social goals. When the implied function is inconsistent with these goals, the slogan decreases interest in the product (Fennis & Stroebe, 2010; Han & Shavitt, 1994; Uskul & Oyserman, 2010). Accordingly, if exposure to recession cues increases women's mate attraction motivations as we have hypothesized, we should find that these cues boost women's desire for beauty products when advertised as serving a mate attraction function (the lipstick effect). Conversely, we should find that the lipstick effect gets suppressed when comparable products are promoted in a way that does not explicitly promote their mate attraction benefits.

We also sought to identify in Study 5 which women are driving the lipstick effect. As discussed earlier, economic recessions are predicted to spur beautification effort because such effort increases the likelihood of attracting mates with resources when such mates are rarified. Accordingly, the effect of recessionary cues on attractiveness-enhancement effort should be strongest among women reporting strong motivation to attract a mate—specifically women looking for mates with resources. Much research indicates that women's preference for resource access is strongest among those looking for a long-term romantic partner (see, e.g., Buss, 1988a; Li et al., 2002; Li & Kenrick, 2006). This contextual specificity is reasoned to reflect the unique adaptive challenges confronting women when choosing someone with whom to share the burden of reproduction and child rearing (Symons, 1979; Trivers, 1972). Given that resource access is particularly salient to women in the context of long-term mating, we predicted that the lipstick effect should be strongest among women who report being actively motivated to attract a long-term mate.

Method

Participants. Seventy-two unmarried female university students served as participants in this study (35 in the recession condition and 37 in the control). Participants' ages ranged from 18

to 22 years ($M = 18.59$, $SD = 1.82$), and participation partially fulfilled a course requirement.

Design and procedure. The overall design of the study was a 2 (prime condition: recession vs. control, between subjects) \times 2 (product function: mating vs. control, within subjects) mixed factorial design. The procedure, cover story, and testing sessions were similar to those used in Study 3. The key differences were that the cover story highlighted that the researchers were interested in preferences for different types of advertisements. A suspicion probe performed at the end of the study revealed that none of the participants knew the true nature of the experiment.

Products. Participants viewed six advertisements for three different products (jeans, perfume, and boots). Pilot testing with 26 women indicated that each of the two depicted products within each product category (jeans, perfume, and boots) were matched for desirability to women before the addition of the slogan (rated on 7-point scales where 1 = *very undesirable* and 7 = *very desirable*) ($M_{\text{mating slogan}} = 3.31$, $SD = 0.78$; $M_{\text{neutral slogan}} = 3.50$, $SD = 1.02$), $F(1, 25) = 1.35$, $p = .65$.

After ensuring products were matched on desirability to women, the advertisements were then manipulated using Photoshop to add a slogan promoting the product's function. Half of the slogans were created to imply that the product specifically functions to attract mates. The other half were created to imply the product serves a primary function unrelated to mating (e.g., comfort, identity expression). The three mating ads had the following slogans: (a) "Who says the way to a man's heart is his stomach?" (jeans); (b) "Now you've got him right where you want him" (boots); and (c) "Be desired" (perfume). The three nonmating ads had the following slogans: (a) "Your new best friend" (jeans); (b) "Not your mother's black boots" (boots); and (c) "Ralph Lauren Introduces" (perfume). Participants saw each advertisement in randomized order.

To ensure that the addition of the mating slogans would lead women to perceive these products as being better at attracting mates than those with the control slogans, a pilot study was conducted with a separate sample of women. To this end, 42 female university students aged 17–23 ($M_{\text{age}} = 18.95$, $SD = 1.19$) completed a computer-based questionnaire wherein they viewed each product-slogan pair and were asked to indicate on a 7-point scale how much they agreed with the following statement: "I would want to buy this product if I were trying to attract a mate." Responses were provided on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Findings showed that women found each of the three products with mating slogans significantly more desirable for mate attraction purposes than their comparable control products: (a) jeans ($M_{\text{mating}} = 5.00$, $SD = 1.41$; $M_{\text{control}} = 3.98$, $SD = 1.68$), $F(1, 41) = 9.97$, $p = .003$, $d = 0.66$; (b) boots ($M_{\text{mating}} = 4.64$, $SD = 1.58$; $M_{\text{control}} = 3.69$, $SD = 1.54$), $F(1, 41) = 16.99$, $p < .001$, $d = 0.61$; (c) perfume ($M_{\text{mating}} = 4.88$, $SD = 1.42$; $M_{\text{control}} = 4.26$, $SD = 1.53$), $F(1, 41) = 4.34$, $p = .04$, $d = 0.42$. Thus, the products promoted with mate attraction slogans were perceived by women as being more effective for attracting mates than those advertised with the control slogans.

Primary dependent measures. For each advertisement, participants indicated their agreement (on a 7-point scale where 1 = *strongly disagree* and 7 = *strongly agree*) to the following statements: (a) "I am very interested in buying this product"; (b) "This

is a product that I would like to buy”; and (c) “I want to have this product.” The three items were averaged together to form a composite measure for each of the two versions of the products (jeans: $\alpha \geq .77$, boots: $\alpha \geq .85$, perfume: $\alpha \geq .75$).

Motivation to attract a relationship partner. Participants indicated their motivation to attract a relationship partner by indicating how much they agreed or disagreed with the following statement: “At this point in my life, I am very motivated to attract a committed, long-term romantic partner” (7-point scale where 1 = *strongly disagree* and 7 = *strongly agree*). To ensure that the economic recession manipulation did not influence responses to this item, participants answered the item as part of a mass pre-screen survey administered approximately 2 weeks before the experiment.

Results

We created a composite measure for the three mating advertisements ($\alpha = .83$) and the three nonmating advertisements ($\alpha = .76$). These composites (desire to purchase products serving a mate attraction vs. control function) served as the dependent variables in the models that follow.

Main effects. Next, to test the effect of priming condition on women’s desire to purchase beauty products promoted as serving a mating or nonmating function, we performed a 2×2 mixed model ANOVA in which prime condition was the between-subjects factor and product function was the within-subjects factor. This analysis revealed a significant interaction between prime condition and product type, $F(1, 69) = 10.40, p = .002$. We next tested the specific predictions of the study.

As in Studies 2–4, the findings for the mating products revealed a main effect of condition, whereby women in the economic recession condition had a significantly greater desire to buy products that were seen as effectively enhancing attractiveness to mates. Consistent with the previous studies, recession cues once again increased women’s desire for products that were advertised as serving a mate attraction function compared with women in the control condition ($M_{\text{recession}} = 4.71, SD = 0.90; M_{\text{Control}} = 4.37, SD = 0.97$), $F(1, 69) = 5.28, p = .03, d = 0.36$ (see Figure 5).

Conversely, the economic recession prime had no effect on the same products when they were promoted as serving a function unrelated to mating ($M_{\text{Recession}} = 4.25, SD = 0.93; M_{\text{Control}} = 4.37, SD = 0.97$), $F(1, 69) = 0.12, p = .73, d = 0.13$ (see Figure 5). In the same way that recession cues did not increase women’s desire for the discount products in Study 4, recession cues did not increase women’s desire for products promoted as serving a primary function unrelated to enhancing desirability to mates. Taken together, these findings conceptually replicated Studies 2, 3, and 4, demonstrating that economic recession cues increased women’s desire for products that were perceived as most effective for attracting a mate. But economic recession cues did not enhance desire for products that were perceived as less effective at attracting a mate.

Moderation. We next tested whether the effects of the economic recession prime on desire for mate attraction or control products were moderated by individual differences in mate attraction goals. To test this possibility, we used multiple regression. Condition (dummy coded) and mating motivation (centered) were entered simultaneously as predictors in the first step, followed by

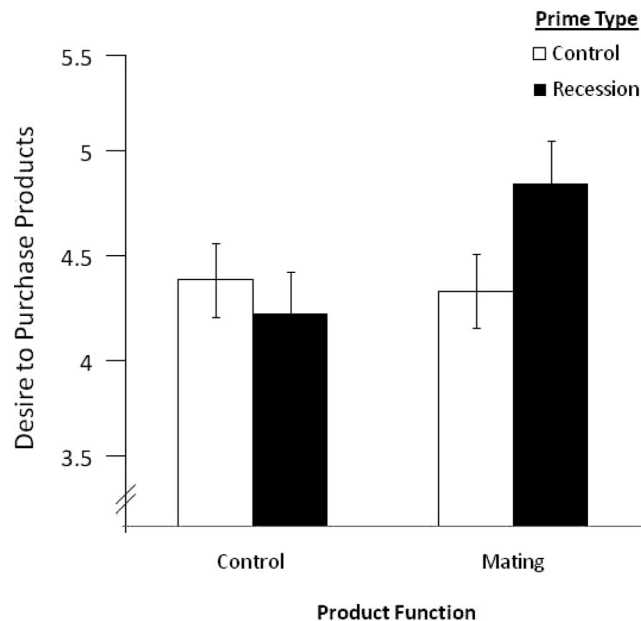


Figure 5. The effect of economic recession cues on women’s desire to purchase products advertised as serving a mating or a nonmating function (Study 5). Error bars reflect standard error of the mean.

the two-way interaction in the second step. For control products (those not promoted as serving a mate attraction), results revealed no significant interaction between condition and women’s mating motivation on desire to purchase these products ($p = .15$). However, for products promoted as serving a mate attraction motivation, results revealed that, in addition to the main effect of condition reported above ($\beta = .27, SE = .13, t(67) = 3.54, p = .001$), there was a significant interaction between condition and mating motivations on women’s purchasing desires ($\beta = .27, SE = .08, t(67) = 2.24, p = .03$). Simple slope tests (Rosenthal & Rosnow, 1985) revealed that for participants in the recession condition, increased motivation to attract a mate was positively related to the desire to buy beauty products promoted as serving a mate attraction function ($\beta = .33, SE = .05, t(67) = 3.30, p = .002$). No such relationship was present for those in the control condition ($p = .85$). Furthermore, examining the effects of recession (vs. control) at one standard deviation above and below the mean on continuous mating motivation scores revealed that for women reporting greater mating motivations, recession cues led to a greater desire for products promoted as serving a mating function than was found in the control condition ($\beta = .45, SE = .19, t(67) = 4.19, p < .001$ (see Figure 6). No such effects of recession cues were found for women reporting low motivation to attract a romantic partner, however ($p = .41$).

Discussion

Once again, we found support for the lipstick effect in Study 5. When jeans, perfume, and high-heeled boots were advertised as serving a mate attraction function, economic recession cues increased women’s desirability for those products. However, when the same products were advertised as serving a nonmating func-

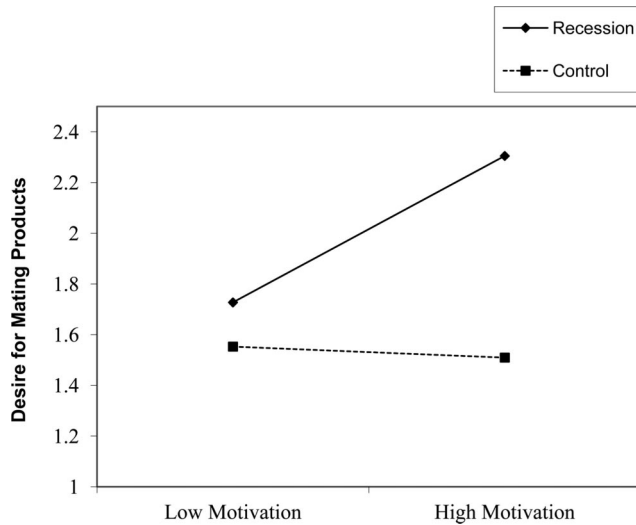


Figure 6. The effect of economic recession cues on women's interest in purchasing mating-related products as a function of desire to attract a mate (Study 5).

tion, the lipstick effect was suppressed. This result is consistent with others' research on motivation and persuasion (e.g., Han & Shavitt, 1994; Uskul & Oyserman, 2010) and lend further support for the idea that cues to economic recessions motivate women to allocate resources toward immediate mating effort by wanting products that can help attract a mate.

Note that women in the present study did not experience a heightened desire for beauty products promoted with control slogans. At first blush, this null effect may appear to contradict the results of Studies 2–4. However, it is important to point out that product slogans—even seemingly neutral ones—influence people's perceptions of the associated products' function (Boush, 1993; Leclerc, Schmitt, & Dube, 1994; Pryor & Brodie, 1998). Because the products in Studies 2–4 were presented to participants without an accompanying slogan, women seeking to augment their attractiveness to mates in response to recession cues likely perceived them as serving a mate attraction function because they had no message indicating otherwise (i.e., they did not see a slogan promoting an alternate product function). Conversely, when the beauty products were promoted in terms of a function not explicitly related to mate attraction, as was done with the control products in the present study, the lipstick effect was suppressed due to the inconsistency between the product message and the women's activated goal state (e.g., Fennis & Stroebe, 2010).

Study 5 also revealed which women are driving the lipstick effect. We found the strongest lipstick effect among women reporting high motivation to attract a mate. This pattern shows that the lipstick effect is driven by women who desire to attract a relationship partner, which is consistent with the lipstick effect reflecting increased mate attraction effort. Taken together, these results lend additional support for the hypothesis that the lipstick effect emerges in response to heightened mate attraction goals in the face of diminished access to mates with resources.

General Discussion

Although consumer spending tends to decline in economic recessions, some observers have noted that economic downturns may be associated with an increase in women's spending on beauty products—the so-called lipstick effect. Using both historical data on real consumer spending and four rigorous experiments, we tested how and why economic recessions influenced women's mating psychology and consumer behavior.

Examining real-world data over the last 20 years, we found that fluctuating economic conditions, as indexed by unemployment, are related to consumer spending priorities. Whereas higher unemployment was associated with decreased spending on products unrelated to appearance such as furniture, electronics, and leisure/hobby products, higher unemployment was associated with increased spending on appearance-related products such as cosmetics and clothing. As unemployment went up, people spent relatively more of their money on products that could enhance physical appearance. Building on these real-world findings, we found the same pattern in four experiments in which we directly manipulated exposure to economic recession cues. Whereas exposure to recession cues decreased men's and women's desire to purchase products unrelated to appearance, recession cues persistently increased women's desire to purchase beauty products, including lipstick. Taken together, findings empirically demonstrate the lipstick effect, showing that women seek to boost beauty specifically in times of economic recession.

Our experiments also revealed that the psychological processes driving the lipstick effect are rooted in women's mating psychology. Because there are fewer men with access to resources in recessionary periods, women's desire for resource access in a mate increased in response to recession cues (Study 3). This shift was found to mediate the relationship between recession cues and women's desire for beauty products. Our model was further supported with the results from Study 4, which demonstrated that the lipstick effect is not moderated by women's own resource need. Consistent with the lipstick effect emerging from women's mate preferences, which are not contingent on need, we found evidence for a robust lipstick effect in women across levels of SES. These findings detract from predictions made from social roles theory, which would predict that the lipstick effect reflects resource-deprived women seeking resources from men any way they can, including through attractiveness enhancement. Lastly, our results indicated that economic recessions were also most likely to spur yearning for beauty products among women who wanted to attract a relationship partner (Study 5). Taken together, these findings show that the lipstick effect reflects a strategic shift in women's consumer behavior that is guided by the desire to attract the mates they most desire in an environment where they are rarified.

Our findings on how economic recessions influence psychology and behavior add to a growing literature on evolution and cognition (e.g., Ackerman et al., 2006; Hill, DelPriore, & Vaughan, 2011; Kenrick, Griskevicius, Neuberg, & Schaller, 2010; Maner et al., 2005; Miller & Maner, 2010; Navarrate et al., 2009; Roney, 2003) and evolution and behavior (e.g., Ermer, Cosmides, & Tooby, 2008; Griskevicius, Cialdini, & Kenrick, 2006; Ronay &

von Hippel, 2010; Van Vugt, De Cremer, & Janssen, 2008). By showing how and why economic recessions influence women's psychology and behavior, our studies provide novel links between the economic climate, psychology, and behavior. Although some observers may deem increased spending on beauty products during a recession as an irrational pursuit, our findings suggest that this strategic shift in women's spending may reflect a deeper adaptive rationality. Women's psychologies may have been shaped to respond to economic resource scarcity by allocating more effort into securing a financially secure mate in an environment where such mates are scarce.

Limitations and Future Directions

Because we were specifically interested in the lipstick effect, we focused on how recessionary cues influence women's psychology. Of course, men's psychology and behavior are also likely to be sensitive to economic recessions. For instance, given that the present research indicates that economic recessions increase the premium women place on a man's access to resources, men may become more intrasexually competitive to garner these resources. For instance, one possibility is that a harsh economic climate might lead men who have resources, particularly those seeking romantic partners, to conspicuously broadcast their wealth to attract mates in this climate (Griskevicius et al., 2007; Sundie et al., 2011). Another possibility is that such economic conditions may lead men who are unable to maintain steady employment in such a climate to be more likely to resort to lying, cheating, or stealing as a means of resource acquisition.

The results of the present research can also be extended to understand how recessionary cues influence other aspects of women's psychology. Given that recession cues increase the benefits available to women from intrasexual competition, it is possible that this may have implications for less benign behaviors that women use to increase their desirability relative to their competitors. For instance, research indicates that intrasexual pressures increase women's willingness to take attractiveness-enhancement risks (e.g., tanning) (Hill & Durante, 2011) and promote hostile actions toward other women (Buss & Dedden, 1990; Fisher, 2004; Fisher, Tran, & Voracek, 2008; Griskevicius et al., 2009). Accordingly, recessions may have a negative impact on women's health, on the one hand, and the quality and durability of their friendships with other women, on the other. Future research is poised to investigate the many ways that economic recessions are likely to influence men's and women's psychology and behavior.

It is important to point out that although Study 4 was designed, in part, to rule out an alternative hypothesis derived from social roles theory (i.e., that the lipstick effect emerges in response to women's resource need), this does not imply that local norms and gender roles have no role in shaping behaviors such as the lipstick effect. Although beyond the scope of the present article, it is likely that the lipstick effect is dependent on culturally mediated beliefs about femininity and attractiveness that relate to culture-specific social roles. For example, although men universally desire physical attractiveness in a mate, women in different cultures might use different means to enhance their attractiveness. This clarification is necessary because an evolutionary perspective is sometimes treated as an alternative to proximate-level theories, such as social roles

theory. However, an evolutionary theoretical framework focuses on ultimate causation, whereby behavior is explored in terms of its ultimate adaptive function (i.e., why we should expect a behavior to emerge based on principles from evolutionary biology; see, e.g., Alcock & Sherman, 1994; Reeve & Sherman, 1993). Accordingly, hypotheses derived from this framework are not necessarily incompatible with hypotheses designed to explain behavior based on proximate-level social forces (e.g., social roles, gender typing, etc.) (see, e.g., Confer et al., 2010; Kenrick, Maner, & Li, 2005; Perilloux et al., 2010). A thorough understanding of any social behavior requires explanation at all levels: evolutionary function based, situation based (e.g., norms), person based (e.g., individual differences), brain based (e.g., functional magnetic imaging studies), and so on.

Conclusion

Economists have established that recessions are reliably associated with increased spending on two types of products: traditional inferior goods (e.g., spending more on tuna rather than salmon because of budgetary constraints) and morale boosters (e.g., going to see a Charlie Chaplin film in the Great Depression). Although the lipstick effect has garnered some anecdotal lore, the present research suggests that women's spending on beauty products may be the third indicator of economic recessions—an indicator that may be rooted in our ancestral psychology.

Although the lipstick effect relates to a range of products that can enhance women's attractiveness, April Benson, a clinical psychologist in New York City, believes that lipstick, a product that can immediately and dramatically change a woman's appearance, epitomizes the core of the phenomenon: "[Lipstick is] very primal. . . It's part of the uniform of desirability and attractiveness" (Schaefer, 2008). Perhaps nowhere is this primal response clearer than for someone like Melissa McQueeney, a 34-year-old unmarried teacher in Connecticut. In the face of increasing bills and economic recession, she adamantly refuses to stop buying lipstick. Continuing to shop at Sephora during the recession, she triumphantly walks to the register with a new lip gloss: "I didn't even try it on. I'm just splurging" (Schaefer, 2008).

References

- Ackerman, J. M., Shapiro, J. R., Neuberg, S. L., Kenrick, D. T., Becker, D. V., Griskevicius, V., . . . Schaller, M. (2006). They all look the same to me (unless they're angry): From out-group homogeneity to out-group heterogeneity. *Psychological Science, 17*, 836–840. doi:10.1111/j.1467-9280.2006.01790.x
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications.
- Alcock, J., & Sherman, P. W. (1994). The utility of the proximate-ultimate dichotomy in ethology. *Ethology, 96*, 58–62. doi:10.1111/j.1439-0310.1994.tb00881.x
- Allison, M., & Martinez, A. (2010, September 9). Beauty-products sales bright spot during recession. *The Seattle Times*. Retrieved from <http://seattletimes.com>
- Andersson, M. (2004). Social polyandry, parental investment, sexual selection, and evolution of reduced female gamete size. *Evolution, 58*, 24–34.
- Andersson, M. (2005). Evolution of classical polyandry: Three steps to

- female emancipation. *Ethology*, *111*, 1–23. doi:10.1111/j.1439-0310.2004.01057.x
- Aune, R. K., & Aune, K. S. (1994). The influence of culture, gender, and relational status on appearance management. *Journal of Cross-Cultural Psychology*, *25*, 258–272. doi:10.1177/0022022194252006
- Baily, M. N., & Elliott, D. J. (2009). *The US financial and economic crisis: Where does it stand and where do we go from here?* Retrieved from http://www.brookings.edu/papers/2009/0615_economic_crisis_baily_elliott.aspx
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182. doi:10.1037/0022-3514.51.6.1173
- Belsky, J., Schlomer, G. L., & Ellis, B. J. (2011, July 11). Beyond cumulative risk: Distinguishing harshness and unpredictability as determinants of parenting and early life history strategy. *Developmental Psychology*. Advance online publication. doi:10.1037/a0024454
- Bertola, G., & Pistaferri, L. (2005). Uncertainty and consumer durables adjustment. *Review of Economic Studies*, *72*, 973–1008. doi:10.1111/0034-6527.00358
- Bohlen, B., Carlotti, S., & Mihas, L. (2010). How the recession has changed US consumer behavior. *McKinsey Quarterly*, *1*, 17–20.
- Boush, D. M. (1993). How advertising slogans can prime evaluations of brand extensions. *Psychology & Marketing*, *10*, 67–78. doi:10.1002/mar.4220100106
- Bureau of Labor Statistics. (2011). *Series report on U.S. unemployment* [Data file]. Available from <http://data.bls.gov/pdq/SurveyOutputServlet>
- Business Wire News. (2009, February 27). Three top economists agree 2009 worst financial crisis since great depression; risks increase if right steps are not taken. *Reuters*. Retrieved from <http://www.reuters.com/article/2009/02/27/idUS193520+27-Feb-2009+BW20090227>
- Buss, D. M. (1988a). The evolution of human intrasexual competition: Tactics of mate attraction. *Journal of Personality and Social Psychology*, *54*, 616–628. doi:10.1037/0022-3514.54.4.616
- Buss, D. M. (1988b). From vigilance to violence: Tactics of mate retention in American undergraduates. *Ethology and Sociobiology*, *9*, 291–317. doi:10.1016/0162-3095(88)90010-6
- Buss, D. M. (1994). The strategies of human mating. *American Scientist*, *82*, 238–249.
- Buss, D. M., & Dedden, L. A. (1990). Unmitigated agency and unmitigated communion: An analysis of the negative components of masculinity and femininity. *Sex Roles*, *22*, 555–568. doi:10.1007/BF00288234
- Buss, D. M., & Shackelford, T. K. (1997). Susceptibility to infidelity in the first year of marriage. *Journal of Research in Personality*, *31*, 193–221. doi:10.1006/jrpe.1997.2175
- Chakravarthy, M. V., & Booth, F. W. (2004). Eating, exercise, and “thrifty” genotypes: Connecting the dots toward an evolutionary understanding of modern chronic diseases. *Journal of Applied Physiology*, *96*, 3–10. doi:10.1152/japplphysiol.00757.2003
- Charnov, E. L. (1993). *Life history invariants*. Oxford, England: Oxford University Press.
- Chisholm, J. S. (1993). Death, hope, and sex: Life-history theory and the development of reproductive strategies. *Current Anthropology*, *34*, 1–24. doi:10.1086/204131
- Clutton-Brock, T. (2009). Sexual selection in females. *Animal Behaviour*, *77*, 3–11. doi:10.1016/j.anbehav.2008.08.026
- Confer, J. C., Easton, J. A., Fleischman, D. S., Goetz, C., Lewis, D. L., Perilloux, C., & Buss, D. M. (2010). Evolutionary psychology: Questions, prospects, and limitations. *American Psychologist*, *65*, 110–126.
- Cotton, S., Small, J., & Pomiankowski, A. (2006). Sexual selection and condition-dependant mate preferences. *Current Biology*, *16*, R755–R765. doi:10.1016/j.cub.2006.08.022
- Crawford, J. R., & Henry, J. D. (2004). The positive and negative affect schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *Journal of Clinical Psychology*, *43*, 245–265. doi:10.1348/0144665031752934
- Daly, J. A., Hogg, E., Sacks, D., Smith, M., & Zimring, L. (1983). Sex and relationship affect social self-grooming. *Journal of Nonverbal Behavior*, *7*, 183–189. doi:10.1007/BF00986949
- De Hauw, S., & De Vos, A. (2010). Millennials’ career perspective and psychological contract expectations: Does the recession lead to lowered expectations? *Journal of Business and Psychology*, *25*, 293–302. doi:10.1007/s10869-010-9162-9
- de Sousa Campos, L. S., Otta, E., & de Oliveira Siqueira, J. (2002). Sex differences in mate selection strategies: Content analyses and responses to personal advertisements in Brazil. *Evolution and Human Behavior*, *23*, 395–406. doi:10.1016/S1090-5138(02)00099-5
- Dibaji, A., Powers, S., & Keswani, P. (2010). *U.S. household and personal products: The “great recession” and shifts in consumer behavior*. New York, NY: AllianceBernstein.
- Dodds, W. B. (1995). How market cues affect product evaluations. *Journal of Marketing: Theory and Practice*, *3*, 50–63.
- Dodds, W. B. (1996). Perceived value: A dimension of the consumer risk construct. *American Journal of Business*, *11*, 15–22. doi:10.1108/19355181199600001
- Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers’ product evaluations. *Journal of Marketing Research*, *28*, 307–319. doi:10.2307/3172866
- Dunn, M. J., Brinton, S., & Clark, L. (2010). Universal sex differences in online advertisers age preferences: Comparing data from 14 cultures and 2 religious groups. *Evolution and Human Behavior*, *31*, 383–393. doi:10.1016/j.evolhumbehav.2010.05.001
- Durante, K. M., Griskevicius, V., Hill, S. E., Perilloux, C., & Li, N. P. (2011). Ovulation, female competition, and product choice: Hormonal influences on consumer behavior. *Journal of Consumer Research*, *37*, 921–934. doi:10.1086/656575
- Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist*, *54*, 408–423. doi:10.1037/0003-066X.54.6.408
- Elliott, L. (2008, December, 22). Into the red: ‘Lipstick effect’ reveals the true face of the recession. *The Guardian*. Retrieved from <http://www.guardian.co.uk>
- Ellis, B. J., Figueredo, A. J., Brumbach, B. H., & Schlomer, G. L. (2009). Fundamental dimensions of environmental risk: The impact of harsh versus unpredictable environments on the evolution and development of life history strategies. *Human Nature*, *20*, 204–268. doi:10.1007/s12110-009-9063-7
- Ermer, E., Cosmides, L., & Tooby, J. (2008). Relative status regulates risky decision making about resources in men: Evidence for the co-evolution of motivation and cognition. *Evolution and Human Behavior*, *29*, 106–118. doi:10.1016/j.evolhumbehav.2007.11.002
- Feingold, A. (1990). Gender differences in effects of physical attractiveness on romantic attraction: A comparison across five research paradigms. *Journal of Personality and Social Psychology*, *59*, 981–993. doi:10.1037/0022-3514.59.5.981
- Feingold, A. (1991). Sex differences in the effects of similarity and physical attractiveness on opposite-sex attraction. *Basic and Applied Social Psychology*, *12*, 357–367. doi:10.1207/s15324834basps1203_8
- Fennis, B. M., & Stroebe, W. (2010). *The psychology of advertising*. New York, NY: Psychology Press.
- Fisher, M. L. (2004). Female intrasexual competition decreases female facial attractiveness. *Proceedings of the Royal Society of London, Series B (Supplemental)*, *271*, S283–285.
- Fisher, M. L., Tran, U. S., & Voracek, M. (2008). The influence of relationship status, mate seeking, and sex on intrasexual competition. *The Journal of Social Psychology*, *148*, 493–508. doi:10.3200/SOCP.148.4.493-512
- Gottschall, J., Martin, J., Quish, H., & Rea, J. (2004). Sex differences in

- mate choice criteria are reflected in folktales from around the world and in historical European literature. *Evolution and Human Behavior*, 25, 102–112. doi:10.1016/S1090-5138(04)00007-8
- Griskevicius, V., Cialdini, R. B., & Kenrick, D. T. (2006). Peacocks, Picasso, and parental investment: The effects of romantic motives on creativity. *Journal of Personality and Social Psychology*, 91, 63–76.
- Griskevicius, V., Delton, A. W., Robertson, T. E., & Tybur, J. M. (2011). The environmental contingency of life history strategies: Influences of mortality and socioeconomic status on reproductive timing. *Journal of Personality and Social Psychology*, 100, 241–254. doi:10.1037/a0021082
- Griskevicius, V., Tybur, J. M., Delton, A. W., & Robertson, T. E. (2011). The influence of mortality and socioeconomic status on risk and delayed rewards: A life history theory approach. *Journal of Personality and Social Psychology*, 100, 1015–1026. doi:10.1037/a0022403
- Griskevicius, V., Tybur, J. M., Gangestad, S. W., Perea, E. F., Shapiro, J. R., & Kenrick, D. T. (2009). Aggress to impress: Hostility as an evolved context-dependent strategy. *Journal of Personality and Social Psychology*, 96, 980–994. doi:10.1037/a0013907
- Griskevicius, V., Tybur, J. M., Sundie, J. M., Cialdini, R. B., Miller, G. F., & Kenrick, D. T. (2007). Blatant benevolence and conspicuous consumption: When romantic motives elicit strategic costly signals. *Journal of Personality and Social Psychology*, 93, 85–102. doi:10.1037/0022-3514.93.1.85
- Han, S., & Shavitt, S. (1994). Persuasion and culture: Advertising appeals in individualistic and collectivistic societies. *Journal of Experimental Social Psychology*, 30, 326–350. doi:10.1006/jesp.1994.1016
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408–420. doi:10.1080/03637750903310360
- Hayhoe, C. R., Leach, L. J., Turner, P. R., Bruin, M., & Lawrence, F. C. (2000). Differences in spending habits and credit use of college students. *Journal of Consumer Affairs*, 34, 113–133. doi:10.1111/j.1745-6606.2000.tb00087.x
- Hill, S. E., DelPriore, D. J., & Vaughan, P. W. (2011). The cognitive consequences of envy: Attention, memory, and self-regulatory depletion. *Journal of Personality and Social Psychology*, 101, 653–666. doi:10.1037/a0023904
- Hill, S. E., & Durante, K. M. (2009). Do women feel worse to look their best? Testing the relationship between self-esteem and fertility status across the menstrual cycle. *Personality and Social Psychology Bulletin*, 35, 1592–1601. doi:10.1177/0146167209346303
- Hill, S. E., & Durante, K. M. (2011). Courtship, competition, and the pursuit of attractiveness: Mating goals facilitate health-related risk-taking and strategic risk suppression in women. *Personality and Social Psychology Bulletin*, 37, 383–394. doi:10.1177/0146167210395603
- Hill, S. E., Rodeheffer, C. D., DelPriore, D., & Butterfield, M. E. (2012). *A life history perspective on women's calorie regulation psychology: Food, fat, and fertility suppression*. Manuscript submitted for publication.
- Hilsenrath, J., Ng, S., & Paletta, D. (2008, September 18). Worst crisis since '30s, with no end yet in sight. *The Wall Street Journal*. Retrieved from <http://online.wsj.com/article/SB122169431617549947.html>
- Jennions, M. D., & Petrie, M. (1997). Variation in mate choice and mating preferences: A review of causes and consequences. *Biological Reviews of the Cambridge Philosophical Society*, 72, 283–327. doi:10.1017/S0006323196005014
- Kaplan, H. S., & Gangestad, S. W. (2005). Life history theory and evolutionary psychology. In D. M. Buss (Ed.), *Handbook of evolutionary psychology* (pp. 68–95). New York, NY: Wiley.
- Katona, G. (1974). Psychology and consumer economics. *Journal of Consumer Research*, 1, 1–8. doi:10.1086/208575
- Kenrick, D. T., Griskevicius, V., Neuberg, S. L., & Schaller, M. (2010). Renovating the pyramid of needs: Contemporary extensions built upon ancient foundations. *Psychological Science*, 5, 292–314.
- Kenrick, D. T., & Keefe, R. C. (1992). Age preferences in mates reflect sex differences in human reproductive strategies. *Behavioral and Brain Sciences*, 15, 75–91. doi:10.1017/S0140525X00067595
- Kenrick, D. T., Maner, J., & Li, N. P. (2005). Evolutionary social psychology. In D. M. Buss (Ed.), *Handbook of evolutionary psychology* (pp. 803–827). New York, NY: Wiley.
- Koehn, N. F. (2001). Estee Lauder and the market for prestige cosmetics. *Harvard Business School Cases*, 801–362, 1–44.
- Leclerc, F., Schmitt, B. H., & Dube, L. (1994). Foreign branding and its effects on product perceptions and attitudes. *Journal of Marketing Research*, 31, 263–270. doi:10.2307/3152198
- Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, 82, 947–955. doi:10.1037/0022-3514.82.6.947
- Li, N. P., & Kenrick, D. T. (2006). Sex similarities and differences in preferences for short-term mates: What, whether, and why. *Journal of Personality and Social Psychology*, 90, 468–489. doi:10.1037/0022-3514.90.3.468
- Lichtenstein, D., Ridgeway, N. M., & Netemeyer, R. G. (1993). Price perceptions and consumer shopping behavior: A field study. *Journal of Marketing Research*, 30, 234–245. doi:10.2307/3172830
- Maner, J. K., Kenrick, D. T., Neuberg, S. L., Becker, D. V., Robertson, T., Hofer, B., . . . Schaller, M. (2005). Functional projection: How fundamental social motives can bias interpersonal perception. *Journal of Personality and Social Psychology*, 88, 63–78. doi:10.1037/0022-3514.88.1.63
- Miller, G. F. (2009). *Spent: Sex, evolution, and consumer behavior*. New York, NY: Viking.
- Miller, S. L., & Maner, J. K. (2010). Scent of a woman: Men's testosterone responses to olfactory ovulation cues. *Psychological Science*, 21, 276–283. doi:10.1177/0956797609357733
- National Bureau of Economic Research. (2011). US Business cycle expansions and contractions. Retrieved from <http://www.nber.org/cycles.html>
- Navarrete, C. D., Olsson, A., Ho, A., Mendes, W., Thomsen, L., & Sidanius, J. (2009). Fear extinction to an out-group face: The role of target gender. *Psychological Science*, 20, 155–158. doi:10.1111/j.1467-9280.2009.02273.x
- Nelson, E. (2001, November 26). Rising lipstick sales may mean pouting economy. *The Wall Street Journal*, p. B1.
- Perilloux, C., Lewis, D. M., Goetz, C. D., Fleischman, D. S., Easton, J. A., Confer, J. C., & Buss, D. M. (2010). Trade-offs, individual differences, and misunderstandings about evolutionary psychology. *American Psychologist*, 65, 930–932.
- Petev, I., Pistaferri, L., & Ekten, I. S. (in press). Consumption and the Great Recession. In D. Grusky, B. Western, & C. Wimer (Eds.), *The Great Recession*. New York, NY: Russell Sage Foundation.
- Pillsworth, E. G. (2008). Mate preferences among the Shuar of Ecuador: Trait rankings and peer evaluations. *Evolution and Human Behavior*, 29, 256–267. doi:10.1016/j.evolhumbehav.2008.01.005
- Preacher, K. J., & Hayes, A. F. (2008). Contemporary approaches to assessing mediation in communication research. In A. F. Hayes, M. D. Slater, & L. B. Snyder (Eds.), *The Sage sourcebook of advanced data analysis methods for communication research* (pp. 13–54). Thousand Oaks, CA: Sage.
- Pryor, K., & Brodie, R. J. (1998). How advertising slogans can prime evaluations of brand extensions: Further empirical results. *Journal of Product & Brand Management*, 7, 497–508. doi:10.1108/10610429810244666
- Reeve, H. K., & Sherman, P. W. (1993). Adaptation and the goals of evolutionary research. *Quarterly Review of Biology*, 68, 1–32.
- Roff, D. A. (1992). *The evolution of life histories: Theory and analysis*. New York, NY: Chapman & Hall.

- Roff, D. A. (2002). *Life history evolution*. Sunderland, MA: Sinauer.
- Ronay, R., & von Hippel, W. (2010). Power, testosterone, and risk-taking. *Journal of Behavioral Decision Making*, *23*, 473–482. doi:10.1002/bdm.671
- Roney, J. R. (2003). Effects of visual exposure to the opposite sex: Cognitive aspects of mate attraction in human males. *Personality and Social Psychology Bulletin*, *29*, 393–404. doi:10.1177/0146167202250221
- Rosenthal, R., & Rosnow, R. L. (1985). *Contrast analysis: Focused comparisons in the analysis of variance*. Cambridge, England: Cambridge University Press.
- Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass*, *5*, 359–371. doi:10.1111/j.1751-9004.2011.00355.x
- Saad, G. (2007). *The evolutionary bases of consumption*. Mahwah, NJ: Lawrence Erlbaum.
- Sabini, J., & Silver, M. (2005). Gender and jealousy: Stories of infidelity. *Cognition & Emotion*, *19*, 713–727. doi:10.1080/02699930441000490
- Schaefer, K. (2008, May 1). Hard times, but your lips look great. *The New York Times*. Retrieved from <http://www.nytimes.com/2008/05/01/fashion/01SKIN.html?pagewanted=all>
- Schmitt, D. P., & Buss, D. M. (2001). Human mate poaching: Tactics and temptations for infiltrating existing relationships. *Journal of Personality and Social Psychology*, *80*, 894–917. doi:10.1037/0022-3514.80.6.894
- Simpson, J. A., Griskevicius, V., Kuo, S. I.-C., Sung, S., & Collins, W. A. (2012, February 13). Evolution, stress, and sensitive periods: The influence of unpredictability in early versus late childhood on sex and risky behavior. *Developmental Psychology*. Advance online publication. doi:10.1037/a0027293
- Stearns, S. (1992). *The evolution of life histories*. Oxford, England: Oxford University Press.
- Sundie, J. M., Kenrick, D. T., Griskevicius, V., Tybur, J. M., Vohs, K. D., & Beal, D. J. (2011). Peacocks, Porsches, and Thorstein Veblen: Conspicuous consumption as a sexual signaling system. *Journal of Personality and Social Psychology*, *100*, 664–680. doi:10.1037/a0021669
- Symons, D. (1979). *The evolution of human sexuality*. New York, NY: Oxford University Press.
- Tausig, M., & Fenwick, R. (1999). Recession and well-being. *Journal of Health and Social Behavior*, *40*, 1–16. doi:10.2307/2676375
- Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 136–179). Chicago, IL: Aldine.
- U.S. Census Bureau. (2011). Economic indicators of retail trade: Time series data [Data file]. Available from <http://www.census.gov/retail/marts/www/timeseries.html>
- Uskul, A. K., & Oyserman, D. (2010). When message-frame fits salient cultural-frame, messages feel more persuasive. *Psychology & Health*, *25*, 321–337. doi:10.1080/08870440902759156
- Van Vugt, M., De Cremer, D., & Janssen, D. (2007). Gender differences in cooperation and competition: The male-warrior hypothesis. *Psychological Science*, *18*, 19–23. doi:10.1111/j.1467-9280.2007.01842.x
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of Positive and Negative Affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*, 1063–1070. doi:10.1037/0022-3514.54.6.1063
- Waynforth, D., & Dunbar, R. I. M. (1995). Conditional mate choice strategies in humans: Evidence from “Lonely Hearts” advertisements. *Behaviour*, *132*, 755–779. doi:10.1163/156853995X00135
- Williams, G. C. (1975). *Sex and evolution*. Princeton, NJ: Princeton University Press.

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