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Evolutionary Motives and Consumer Food Choice in Romantic Relationships

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EVOLUTIONARY MOTIVES AND CONSUMER FOOD CHOICE IN ROMANTIC RELATIONSHIPS

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
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at the University of Kentucky

By

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ABSTRACT OF DISSERTATION

EVOLUTIONARY MOTIVES AND CONSUMER FOOD CHOICE IN ROMANTIC RELATIONSHIPS

This research examines the evolutionary eating patterns of consumers when eating with those they are in relationships with, moving beyond eating decisions made in isolation or in the presence of strangers. Across three studies, unique patterns of consumption emerge when males and females are in different stages of romantic relationships. I demonstrate that the evolutionary motives of *mate acquisition* and *mate retention* drive eating patterns for relationship partners relative to their gender. I show that females match the eating habits of males at early stages in the relationship but are more independent later in the relationship, while males match eating habits of females in later stages in the relationships but are more independent early in relationships. I discuss how evolutionary eating patterns contribute to high obesity rates, provide recommendations for avoiding unhealthy eating among couples, and shed light on common cultural beliefs about weight gain in social relationships.

KEYWORDS: Evolutionary Motives, Food Choice, Consumer Behavior, Romantic Relationships, Social Influence

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May 6, 2014

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CHAPTER ONE: INTRODUCTION

Obesity continues to represent one of the most significant health issues of our time (Mishra, Mishra, and Masters 2012). As a result, numerous avenues of research have focused on understanding eating behaviors, including unhealthy food associations (Chernev and Gal 2010; Raghunathan, Naylor, and Hoyer 2006; Van Ittersum and Wansink 2012), the impact of nutrition knowledge (Mohr, Lichtenstein and Janiszewski 2012; Moorman et al. 2004), calorie underestimation from portion and package size differences (Argo and White 2012; Chandon and Wansink 2007; Scott et al. 2008), and emotional factors underlying consumption (Kidwell, Hardesty, and Childers 2008; Wood 2009). However, much of our eating behavior involves social relationships – eating with friends, relatives, romantic partners, and colleagues. It remains unclear how these social relationships impact our food choices. For example, might the quantity and types of foods people eat depend on their spouses' eating habits? Does the stage of the relationship impact each individual's food decisions? Could unique patterns of behavior emerge when eating with our relationship partners that can be used to get people to eat healthier foods? If so, how and why do these eating patterns form?

A 32-year long social network study recently identified obesity clusters that developed among individuals in social relationships. In marriages, a wife's chances of becoming obese increased by 44% if her husband became obese, and a husband's chances increased by 37% if his wife became obese (Christakis and Fowler 2007). These clusters suggest that those who are close to us may have powerful influences on our eating behaviors. Moreover, obesity rates have been shown to increase as individuals moved from dating to marriage in romantic relationships (The and Gordon-Larsen 2009),

suggesting that eating patterns may spread within specific types of social relationships. The reasons for why these effects emerge and the patterns underlying these clusters have not yet been adequately addressed.

In this research, I draw on emerging literature suggesting that behavior in social relationships is guided by evolutionary motives (Li et al. 2012). I identify eating patterns based on evolutionary motives influencing how we eat in relation to others. I focus specifically on the evolutionary motives of *mate acquisition* and *mate retention* to assess whether they create pressure for romantic partners to match or show independence from one another's eating styles. In doing so, I shed light on how evolutionary motives affect the food choices of individuals interested in long-term relationships and short-term romantic opportunities. I move beyond initial research suggesting that the body size of others can influence our eating decisions (McFerran et al. 2010a) and demonstrate that *who one eats with* may be more important to healthy consumption than what one knows about food (nutrition knowledge; Moorman et al. 2004) or how one feels about food (comfort eating; Wood 2009).

In addition, prior food research has typically focused on eating decisions made in isolation (Redden and Haws 2013) or when eating based on the food choices of strangers (McFerran et al. 2010a). My research examines longitudinal eating patterns that go beyond single decision settings to show how other people have powerful influences on an individual's food choices over time. Furthermore, I provide prescriptive recommendations about avoiding danger zones of unhealthy eating in relationships.

CHAPTER TWO: CONCEPTUAL BACKGROUND

Evolutionary Motives

Kenrick et al. (2010) have synthesized evolutionary theories to develop a hierarchy of evolutionary motives that guide human behavior. Evolutionary motives theory flows from *inclusive fitness theory,* which posits that humans have been naturally selected to pass their genes into future generations. Physical characteristics and motivation systems have evolved to promote survival and reproduction. Surviving and reproducing requires pursuing intermediate goals, including protecting oneself from harm, attracting a mate, and successfully raising offspring, as well as lower level goals, like maintaining friendships and social connections. Building on *life history theory* and Maslow's (1943) hierarchy of human motivations, Kenrick et al. (2010) organize the hierarchy of evolutionary motives as: immediate physiological needs, self-protection, affiliation, esteem/status, mate acquisition, mate retention, and parenting. Satisfying physiological requirements and protecting oneself are prioritized over higher-level social motives. When there are no longer pressing lower-level requirements, social evolutionary motives can then be pursued.

Any of the evolutionary motives may be active at a given time. When active, a motive triggers evolved cognitions, emotions, and behaviors specific to the evolutionary problem it was designed to solve (Griskevicius, Tybur, and Van den Bergh 2010). For instance, two problems faced by ancestral humans were attracting mates and avoiding danger. Today, an active mate acquisition motive prompts behaviors that can increase attractiveness to potential mates, and an active self-protection motive prompts behaviors

that aid threat avoidance.

The concept of evolutionary problems underlies evolutionary motives research. Evolutionary theories posit that humans are uniquely evolved to solve the problems faced by our ancestors. Modern humans inherited the traits of only those ancestral humans who survived and reproduced. The traits that did not aid survival and reproduction were not passed on. Griskevicius and colleagues linked conformity to evolutionary problem solving (Griskevicius et al. 2006b; Griskevicius et al. 2009). Conformity could have helped ancestral humans because conformity aids acceptance by a group and ancestral humans found safety in groups. However, conformity could have been detrimental to ancestral males because males attracted females by demonstrating uniqueness. Today, males increase conformity when a self-protection motive is active. However, when a mate acquisition motive is active, conformity disappears and males make choices to separate themselves from a group (Griskevicius, Cialdini, and Kenrick 2006a; Griskevicius et al. 2010). In my research, I use the evolutionary problem framework to investigate why relationship partners fall into patterns of obesity together. I hypothesize that certain food choice strategies can be evolutionary problem-solving behaviors. Through this framework, I predict that active evolutionary motives have a profound impact on food choice today.

Evolutionary motives are activated in different ways. The mating and parenting motives become active in a developmental sequence. The mate acquisition motive does not become active until we reach an age of maturity. Mate retention and parenting motives follow mate acquisition. Situations often activate evolutionary motives. For instance, a horror movie might activate a self-protection motive whereas a sunset might

activate a romantic motive. Interactions with social others are a powerful situational influence that can also activate evolutionary motives. These motives vary depending on the nature of the social relationship and thus are likely to induce unique behaviors. For example, with friends or colleagues, the affiliation motive, or fitting in with the group, might be the active motive. However, if one's boss is part of the group, then the status motive could become active, triggering behaviors that help establish one's social superiority over other group members. Similarly, I propose that the people with whom we eat activate specific evolutionary motives based on the nature of our relationship. Importantly, evolutionary motives act at a nonconscious level. Even if individuals are aware that they are responding to situation cues, it is unlikely that they understand the evolutionary significance of their behaviors (Kenrick et al. 2010). In the next section, I describe how actions associated with evolutionary motives – fitting in, standing out, gaining acceptance, establishing status, highlighting personal attractiveness, or reinforcing social standing – are achieved through unique food choice behaviors.

Evolutionary Problems and Modern Food Choice Strategies

Food choices resulting from active evolutionary motives are not well understood. For ancestral humans, food choices were focused on physiological requirements. Early humans needed to survive a violent, hostile environment. Avoiding starvation and securing access to food would have been primary concerns. In modern industrialized societies, food choice does not have the same urgency. When we eat with social others, we know that we can choose meals to satisfy our basic hunger needs. Therefore, higher-level social and mating motives can be pursued through food choice. Furthermore,

situational social factors, like the presence of relevant others, can affect which higher-level motives are pursued. For instance, when satisfying basic hunger needs is not a concern, an individual will be driven to pursue social and mating motives through eating behaviors, and the people with whom one is eating will affect which specific social or mating motive is pursued.

Signaling Attractive Traits

Evolutionary motives drive individuals to both acquire and retain social relationships. One problem faced by early humans was acceptance by a group. Early humans survived in groups. Without group support, ancestral humans would have had to fend for themselves for food and safety. To be accepted by a group, one would have needed to demonstrate his or her value to individual group members. However, valuable evolutionary traits are often unobservable initially, so individuals would have behaved in ways to signal these traits (Griskevicius et al. 2010). For ancestral humans, signaling physical strength, survival skills, resourcefulness, good health, fertility, or parenting skills during a social interaction might have piqued the interest of group members (Kenrick et al. 2009). We posit that signaling attractive unobservable traits occurs in food choice today.

Signaling occurs when something important is unknown to a social other. Today, when eating with a new person or a person with whom one would like a relationship, the foods one chooses may be signals that demonstrate one's attractive qualities. Some signaling food choice behaviors can be enacted independent of the choices of social others. For example, a person could signal strong self-control by foregoing a dessert

without any knowledge of whether social others will order dessert. Other signals take into account the behaviors of social others. For instance, while differentiating and matching are different behaviors, they incorporate information from others and can also signal attractive traits. People can signal uniqueness or status by purposefully differentiating their behavior from that of others in social settings (Ariely and Levav 2000; Mead et al. 2011). A consumer can also engender liking by matching or mimicking the behaviors of others (Lakin and Chartrand 2003; Tanner et al. 2008).

Reinforcing Relationship Dynamics

For ancestral humans, once a social relationship was acquired, signaling would have become less important. Over time, traits would have become observable and the need to signal would have dissipated. Ancestral humans would have then faced the problems of retaining their place or establishing status in the group. Over repeated social interactions with others, an individual would have needed to establish and reinforce relationship dynamics. If one wanted to reinforce liking, one might mimic or match a social other in almost all interactions. If one wanted to reinforce personal uniqueness or dominant status, one might have differentiated in most social encounters. Mimicry or matching might have cemented one's place in a group, achieving the affiliation evolutionary motive. Differentiating would have been high-risk, high-reward. While differentiating oneself might have established status and helped attract a mate, these behaviors might have created social distance and increased the risk of rejection or ostracism (Mead et al. 2011). I posit that the foods we choose today can serve to reinforce relationship dynamics.

Today, when individuals eat together, the foods they choose can reinforce the dynamics of the existing relationship. Differentiating purposefully from the food choices of others can reinforce uniqueness. Matching can reinforce liking. In my research, I expect matching of eating styles, defined here as matching the overall healthiness or unhealthiness of another's food choices, in line with direct mimicry of their choices. Matching a social other's eating style should result in shared patterns of calories per meal, weight gain, and weight loss in social relationships over time. Indeed, these patterns have come to light in recent studies, despite the focus on measuring food intake in a single meal or snack in prior research (Campbell and Mohr 2011; Hermans et al. 2009a; Hermans et al. 2010; Hermans et al. 2009b; Hermans et al. 2011; Koh and Pliner 2009; McFerran et al. 2010a, 2010b). Christakis and Fowler (2007) identified 'obesity clusters' among social relationships that may have resulted from matching social others over time. Leahey et al. (2011) also identified trends that may reflect matching, finding that obese young adults are likely to have close friends who are obese. Healthy eating intentions were shared as well. Obese young adults expressed intentions to lose weight if they perceived their overweight friends as trying to lose weight and establish healthy eating norms. In the next section, I use evolutionary motives to define three romantic relationship stages, then formally predict how evolved food choice strategies address evolutionary problems in each stage of a romantic relationship.

Evolutionary Stages of a Romantic Relationship

Building on the Kenrick et al. (2010) sequence of romantic evolutionary motives – mate acquisition, mate retention, and parenting - I can identify three different romantic

relationship stages. Early in a romantic relationship the mate acquisition motive would be active. As a relationship becomes more serious, effort would shift to mate retention. As partners become more committed to one another, the parenting motive would become active. Behaviors like conformity have been shown to change when different evolutionary motives are active. I predict that the dynamics of eating behaviors will also change under different romantic evolutionary motives. First I outline general characteristics of each motive. Then, I offer specific food choice hypotheses.

The mate acquisition motive would be active when trying to attract a mate. Signaling during this stage is especially important. Attractive evolutionary qualities in a mate are often unobservable. Yet, if these traits are not displayed early, one risks being ruled out as a potential mate. Females and males differ in their evolved preferences for mates, with females preferring status and health in males, and males preferring kindness and agreeableness in females. Females and males should signal qualities attractive to the opposite sex when a mate acquisition motive is active.

As a relationship becomes more serious, the mate retention motive becomes active. In this stage, evolutionary motives drive couples to forge a strong bond as a foundation for successful child-rearing, with the ultimate goals of reproducing and raising children into adulthood. While these are positive forces to strengthen a relationship, for ancestral humans, this relationship stage was accompanied by fears of sexual infidelity and mate abandonment. Today the mate retention motive still prompts behaviors that address two ancestral problems: *paternity uncertainty* for males and *loss of male resources* for females (both discussed in more detail below). Behaviors evoked by the mate retention motive generally fall into two categories: behaviors to deter cheating, like

being vigilant or violent when infidelity is suspected, and behaviors to bolster commitment, like demonstrating caring behaviors toward one's mate (Buss 1988; Buss and Shackelford 1997; Ellis 1998). Both categories of behaviors seek to reinforce the dynamics of the existing romantic relationship.

A relationship becomes stable when the mate retention fears fade. Stability and commitment should evoke the parenting motive for both males and females. Even before a couple has children, a parenting motive will guide partners to build a relationship conducive to successfully raising future offspring. A parenting motive drives individuals to provide offspring the best chance to survive into adulthood, mate, and have children themselves. For ancestral humans, a relationship conducive to child-rearing would have been a parental alliance characterized by a division of labor suited to each partner's own strengths. Hunter-gatherer males would have focused on providing resources and protecting the family. Females would have provided daily care for children during their formative years. Both parents would have been involved in teaching and training children for survival and success. Each parent would have needed to make independent decisions in their domains of expertise. Next, I predict how food choice will change under each relationship stage. A summary of the hypotheses is provided in table 2.1.

TABLE 2.1
TABLE OF HYPOTHESES

Relationship Stage	Evolutionary Motive	Evolutionary Goal(s)	Expected Group Results
Attracting a Mate	Mate Acquisition	Signal attractiveness as a mate	H1: Male food choice is independent of a female's eating style.
			H2: Female food choice matches a male's eating style.
Building a Serious Relationship	Mate Retention	Deter cheating and/or bolster commitment	H3: Male food choice matches a female's eating style.
			H4: Female food choice is independent of a male's eating style.
Stability in a Committed Relationship	Parenting	Prepare children/ future children for survival and success	H5: Male food choice is independent of a female's eating style.
			H6: Female food choice is independent of a male's eating style.
None (Control)	None	None	H7: Both (a) male and (b) female food choice is independent of an opposite sex partner's eating style.

CHAPTER THREE: HYPOTHESIS DEVELOPMENT

Attracting a Mate Stage

The mate acquisition motive would be active in the first stage of a romantic relationship. Eating together is a common activity from the earliest stages of a relationship. On a first date, a couple may eat at a restaurant; on a later date, one person may cook dinner for the other. Since eating is a common shared activity and signaling unobservable attractive qualities is an important component in acquiring a mate, I propose that the mate acquisition motive prompts food choices that signal one's attractiveness as a mate. The mate acquisition motive will drive food choice that increases one's chances of acquiring a romantic relationship. Since males and females prefer different evolutionary qualities, males and females employ different signaling behaviors.

Males

Sexual selection theory posits that females have evolved to be more selective than males in choosing a mate. Since females have a higher *minimal obligatory investment* in any offspring, they must make a wiser mate choice than males (Trivers 1972). This greater selectivity among women triggers greater competition among men (Kenrick et al. 2010). Males often need to stand out and be unique from other males to be seen as an attractive mate. Females prefer males who demonstrate social or physical superiority over other males, or who have traits that demonstrate greater health. Signaling theory and costly signaling theory predict several male strategies for signaling status and success.

These include making visible and expensive purchases, visibly donating to charitable causes to demonstrate altruism, displaying creative behaviors, or making independent decisions that do not conform to a group (Griskevicius et al. 2006a; Griskevicius et al. 2006b; Griskevicius et al. 2009; Griskevicius et al. 2007; Sundie et al. 2011).

Under a mate acquisition motive, a male should choose foods that signal how he is unique from and preferable to other males. When eating with a female, I expect a wide variety of male food choice signals, which I broadly categorize as positive signals, costly signals, or charm signals. Positive signals suggest a congruent trait that would be attractive in a mate or in offspring. For instance, a male may eat healthy to demonstrate strong self-control or a commitment to healthiness, or he may match a female's eating style to signal agreeableness. Costly signals occur when a male incurs a cost to demonstrate an attractive incongruent trait. A healthy, physically fit male could choose an obviously unhealthy meal, either on his own initiative or to differentiate from a healthy female. Eating an unhealthy meal could signal that the male can eat whatever he wants and remain fit, a possible signal of good genes or commitment to physical fitness. Charm signals can signal traits related to social success, and can also make a male more romantically appealing. For instance, a male could patronize a healthy restaurant that the female wants to attend, order dessert after dinner even though he usually would not, or give chocolates as a romantic gift. While romantic, these behaviors might also signal attentiveness, thoughtfulness, charm, or charisma – all traits that can transfer to other social interactions and could enable a male to achieve high social status.

Since a male's primary goal under a mate acquisition motive is to demonstrate uniqueness, I expect individual males to play to their strengths. If a male perceives his

self-control or health is his strongest attribute, he would use positive signals when eating with a female. If a male perceives his strength, physical stature, and attractiveness are his strongest attributes, he might use costly signals. If a male perceives his charm and social skills as his strongest attributes he might use charm signals. Since different males will employ different unhealthy and healthy eating strategies, I expect these different strategies to cancel one another out. Therefore, I do not expect one single strategy to emerge across all males. I would expect the mean calories to be no different for males eating with unhealthy females than for males eating with healthy females. Thus, I predict:

H1: In the attracting a mate stage, male food choice will be independent of a female's eating style.

Females

Females prefer different evolutionary qualities from males. Males prefer physical characteristics that signal youth and fertility, and are attracted to traits that will transfer to successful parenting, like agreeableness, kindness, and warmth (Griskevicius et al. 2009; Kenrick et al. 2010). For females, signaling youth and fertility may conflict with signaling agreeableness, especially if one's culture associates youth and fertility with thinness. When with a male, a female may choose foods or meals with low calories to conform to societal standards of female beauty. Most modern cultures value thinness (McFerran et al. 2010a), and research has demonstrated that eating less enhances a woman's feminine qualities (Chaiken and Pliner 1987; Mori, Chaiken, and Pliner 1987). Yet, thinness in itself does not signal youth and fertility. Males have consistently rated females with a low waist-to-hip ratio and a normal, not thin, body weight as attractive (Singh 1993). Although societal standards for thinness have changed across time, a low

waist-to-hip ratio has been a consistent indicator of attractiveness over time. Singh (1993) concluded that males have an evolutionary mechanism that interprets waist-to-hip ratio as a signal of health, youthfulness, and reproductive potential (Singh 1993). Waist-to-hip ratio has more to do with the distribution of weight in the body, rather than how little or much is eaten at a time. Therefore, eating minimally to remain thin would be a weak signal to males.

I posit that a matching strategy, which can signal agreeableness and kindness, is a more effective signaling strategy than eating minimally. For example, consider a first date between a female with a healthy eating style and a male with an unhealthy eating style. Suppose the female adhered to a strict healthy eating regimen despite what a male may eat or want to eat. The male may feel a physical attraction to her and may receive a signal of future health commitment. On the other hand, suppose the female signals that she normally eats healthy, but is willing to eat unhealthy with the male on this date. The male may receive a signal that she is willing to relax her standards, to be flexible, and to be considerate to the male's preferences – potential signals of agreeableness that will translate to parenting. From an evolutionary perspective, agreeableness should be favored in a future mate, and matching the male's eating style can signal agreeableness. If matching occurs, then in a comparison between two groups of females, I would expect mean calories for females eating with an unhealthy male to be significantly higher than the mean calories of females with a healthy male. Thus, I predict:

H2: In the attracting a mate stage, females will match the eating style of a male eating partner.

Building a Serious Relationship

In this stage, the mate retention motive prompts behaviors to protect oneself from losing a mate to romantic rivals. Consider how the retention of romantic partners might be affected by eating styles. In a serious relationship, couples make frequent food choice decisions together including what restaurants to attend, what foods to cook, and what groceries to purchase. If one partner desires unhealthy foods and the other desires healthy foods, disagreements can easily follow. To resolve this conflict couples may adhere to their preferred eating styles. At home, they may cook meals with unhealthy dishes for one partner and healthy dishes for the other, or possibly they could take turns – unhealthy hamburgers one day, healthy salads the next day.

Yet, evolutionary motives drive partners to develop a bond, and when individual partners continually prefer different eating styles, that bond may not form. Different eating styles may reflect to partners that they have incompatible goals. Imagine a relationship where the partners desire to eat differently from one another every day. Over time, the healthy partner might question whether the couple shares the same long-term health goals. The unhealthy partner might question whether the healthy partner can relax and indulge. The unhealthy partner might also suspect that remaining fit is a way for the healthy partner to attract the opposite sex, resulting in insecurity about the relationship. Different eating styles would work against the evolutionary goal of retaining the romantic relationship. Instead, the mate retention motive should favor a shared eating style, one that would facilitate bonding and minimize disagreements. Because of the different mate retention problems faced by early humans, I posit that the shared eating style will be the style favored by the female, and that a male will match the female eating style.

Males

An ancestral male could never be completely sure that he was the father of any children, a problem known as *paternity uncertainty*. If a female was unfaithful, and if she had a rival male's child, then her mate would not pass his genes into future generations. Males, therefore, have evolved to be wary of attention paid to their mates by other men. Modern males use tactics to deter cheating or bolster commitment to solve the evolutionary problem of paternity uncertainty. Matching the eating style of a female would be a commitment-bolstering retention tactic.

For a male in a serious relationship, the high evolutionary cost of female infidelity creates strong evolutionary pressure to retain his relationship. Consider a male with an unhealthy eating style in a romantic relationship with a healthy eating style female. Sticking with his unhealthy style would create social distance at every joint food choice decision. She would want healthy options; he would want unhealthy options. By persisting with his style, he would implicitly accept a disagreement occurring at almost every joint meal. Instead, evolutionary motives should guide the male to avoid predictable, recurring disagreements that could fracture the relationship and to seek a shared eating style. Matching the female's eating style provides an ideal solution. A male could avoid recurring disagreements by adopting her eating style, and matching her behaviors should increase her liking of him, thereby bolstering her commitment and reducing the risk of infidelity. In a comparison, I would expect mean calories of males eating with an unhealthy female to be significantly higher than the calorie mean for males with a healthy female. Thus, I predict:

H3: In the serious relationship stage, males will match the eating style of a female eating partner.

Females

Ancestral females would have depended on a male's resources for the survival of their children, so male infidelity could have greatly impacted children's survival if accompanied by a diversion of resources. Ancestral females' goals under a retention motive were more concerned with retaining the father's resources than on retaining the mate. This concern reflects a subtle shift from mating effort to parenting effort in the relationship. I posit that the shift to parenting effort means a greater reliance on a female's own instincts rather than concern with matching male behavior. Prior research has suggested that evolution favored females who underestimated a male's commitment to future offspring (Ackerman, Griskevicius, and Li 2011; Haselton and Buss 2000). Evolution has prepared females to successfully raise children with or without paternal support. Therefore, a shift to parenting effort would be accompanied by the freedom to act independently of a male.

Furthermore, a female following her own instincts may indirectly help retain the relationship. For ancestral females, there was a greater risk if emotional infidelity, rather than sexual infidelity occurred. If the male fell in love with another woman, then he might divert his resources to any children he had with the other woman (Campbell and Ellis 2005). When a female acts on her own child-rearing instincts, a male may be reminded of what she offers to offspring, thereby bolstering his commitment to her and to future children.

How might parenting motives affect a female's food choice? Choosing healthy

foods might help produce a healthy child. On the other hand, choosing high calorie or high carbohydrate foods might help prepare the body for the physical demands of being pregnant and taking care of a small child. I suggest that the appropriate food choice will be better understood by females than by males. Therefore, it is unlikely that females would continue to feel evolutionary pressure to match a male's eating style. Instead, a female would prioritize trusting her own instincts about what foods to choose. In a comparison between females, I would expect the mean calories of females eating with an unhealthy male to be no different than mean calories of females with a healthy male. Thus, I predict:

> **H4:** In the serious relationship stage, female food choice will be independent of a male's eating style.

Stability in a Committed Relationship

Under stability, I posit that matching will not be present for males or females. Continually feeling pressure to match one's mate would have been incompatible with the individual decision making needed in a successful ancestral parental alliance. Ancestral established relationships would have allowed the freedom of independent choice within domains of expertise. The parental bond would have been strong enough that independent decision making would not have damaged their ability to successfully raise children. That independence should extend to modern food choice behaviors. Partners in a committed relationship should feel comfortable pursuing their own independent food preferences without evolutionary pressure to signal one's attractiveness or bolster a mate's commitment.

Males

For males, mate retention pressure to match would end when a male accepts his mate's commitment. Fear of infidelity serves an important evolutionary purpose for males; however continual uncertainty about paternity and commitment can have detrimental effects. A father's investment has been linked to increased chances of evolutionary success for children (Geary 2000). Therefore, an ancestral male would have incurred an evolutionary cost if suspicion of infidelity led him to under-prepare his own child for survival. Evolutionary motives should have guided an ancestral male to make a choice: either abandon the mate and the children that he believes are not his, or accept his mate's commitment and accept children as his own. With acceptance would have come stability, and a male could have shifted from protecting himself to positioning children for survival and success.

Stability would allow a male the freedom to make independent decisions as part of his role in the parental alliance. Without mate retention fears, males should feel comfortable diverging from the eating styles of females. In modern food choice, a husband should feel comfortable eating a high calorie meal when his wife does not, or avoiding a dessert that his wife is eating. Thus, I predict:

H5: In the committed relationship stage, male food choice will be independent of a female's eating style.

Females

I predicted that females shifted to parenting effort under a mate retention motive. In the committed relationship stage, females will continue to focus on parenting effort. A

key difference in the two relationship stages is that under mate retention motive, relying on instincts is a way of protecting against losing access to resources. Under a parenting motive, a female would trust her own instincts because they are tied to her role in the parental alliance, not because of fear of mate abandonment. In the commitment stage, females will be more confident in the commitment of their male mates. Females will be comfortable making their own food choices, even if different from the choices of a male. For example, a wife should feel comfortable avoiding the high calorie meal of her husband or eating a dessert even though her husband is not. Thus, I predict:

H6: In the committed relationship stage, female food choice will be independent of a male's eating style.

Finally, in the absence of evolutionary motives, I do not expect males or females to match the eating style of an opposite sex eating partner. Matching is a food choice strategy that aids individuals in achieving evolutionary goals. In the absence of situation cues that trigger those evolutionary goals, I do not expect evolutionary problem-solving behavior. Thus, I predict:

H7: When no relationship stage or evolutionary motive cues are present, (a) male food choice will be independent of a female's eating style, and (b) female food choice will be independent of a male's eating style.

In summary, I predict that evolutionary motives prompt females to match a male's eating style only at the mate attraction stage and males to match a female's eating style only at the serious stage of a romantic relationship. Neither males nor females will match at the committed relationship stage, or when romantic relationship evolutionary

motives are absent.

Plan of Studies

In an initial exploratory study, I use open-ended questions to explore the prevalence and nature of matching a romantic partner's eating style. In study 2, I test my hypotheses in a lab experiment, priming evolutionary motives through romantic relationship primes and manipulating the eating style of a hypothetical opposite sex eating partner. I demonstrate that males, but not females, match the healthiness of another's meal under a serious relationship prime, and females, but not males, match under an attracting a mate prime. Moreover, I discover some unhealthy eating danger zones for males and females in romantic relationships. I test my hypotheses controlling for several known predictors of food choice and susceptibility to social influence. In study 3, I extend my findings using a panel of real consumers in romantic relationships. I use an ego network data collection method to naturally uncover the network of people with whom a participant normally eats. I narrow my analysis to romantic partners and demonstrate that the matching pattern is prevalent in real-life romantic relationships.

CHAPTER FOUR: METHODOLOGY

STUDY 1: INITIAL EXPLORATORY STUDY

Method

Study 1 was conducted to explore the matching of eating styles in romantic relationships. In the study, 88 undergraduates (females, $n = 40$) who were in a romantic relationship answered open-ended thought listing items and elaborated on how opposite sex others influence them to eat unhealthy foods. Responses were coded if the participant mentioned matching the unhealthiness or healthiness of the opposite sex. Table 4.1 provides samples of qualitative responses. Participants also indicated their gender and their romantic relationship status.

Results

Responses were analyzed to test differences based on the stage of a romantic relationship. Participants who reported that they had been in a romantic relationship for less than one year were compared to participants in a relationship longer than one year, engaged, or married. Ten males mentioned matching the unhealthy eating style of females, while another seven males mentioned matching a female's healthy eating style. Overall, 17 out of 48 males mentioned matching, and 15 out of the 17 males were in serious relationships. The males who did not mention matching were evenly split between early relationships ($n = 15$) and long-term relationships ($n = 16$). That is, the count of matching males who were in a long-term relationship was higher than could

have been predicted by chance ($\chi^2 = 6.44$, $df = 1$, $p < .05$). Nineteen females mentioned matching the unhealthy eating style of males, and no females mentioned matching a male's healthy eating style. Overall, 19 out of 40 females mentioned matching (early relationship: $n = 6$; long-term relationship: $n = 13$). However, the proportion of matching females in early relationships to matching females in long-term relationships was no different than the proportion of non-matching females in early relationships ($n = 7$) to non-matching females in long-term relationships ($n = 12$, $\chi^2 = .12$, $df = 1$, NS).

Discussion

Overall, the qualitative responses and the quantitative analysis offer initial support for the prediction that males would match females in the serious relationship stage, but not the attracting a mate stage (H3 H1). However, the prediction that females would match only in the attracting a mate stage was not supported (H2, H4). To further test my hypotheses about evolutionary motives, relationship stages, and gender differences, I designed a lab-based experiment for my next study.

STUDY 2: EVOLUTIONARY MOTIVES PRIMING EXPERIMENT

Overview

Experiments on evolutionary motives generally have a prime-activation-opportunity structure. Researchers use a priming task to activate an evolutionary motive, then provide an opportunity for participants to exhibit behaviors predicted by that motive. I implemented the prime-activation-opportunity structure in study 2. I used romantic relationship primes to activate evolutionary motives. Then I gave participants an opportunity to match the eating style of a hypothetical opposite sex eating partner.

Procedures

For study 2, I conducted a 2 (male, female) x 2 (hypothetical opposite sex eating partner's eating style: unhealthy, healthy) x 4 (evolutionary relationship stage: attracting a mate, serious relationship, committed relationship, control) between-subjects experiment to test the matching of eating styles. Participants (N = 704) began the computer-based study by indicating their gender. All experimental manipulations then referred to a person of the opposite sex. Adapting procedures from Griskevicius et al. (2006a), I used vignettes as primes to manipulate the active evolutionary motive. I primed evolutionary motives by having participants read a vignette, imagine themselves in the described evolutionary relationship scenario, and then complete a writing task.

In the attracting a mate condition, I adapted a vignette from Griskevicius et al. (2006a) to elicit emotions of romantic and sexual arousal and prompt behaviors to make oneself more attractive to the opposite sex. The serious relationship vignette, also adapted

from Griskevicius et al. (2006a), asked participants to imagine themselves in a relationship with a potentially bright future. In the vignette, the future is not yet certain; the partners have not formally established their commitment through acts like living together, engagement, or marriage. In the committed relationship vignette, participants imagine themselves in a romantic relationship where the partners are constant companions who have lived together for five years. The three vignettes are provided in table 4.2.

To strengthen the priming effect, participants were asked to write about the person they imagined, the setting they envisioned, and the emotions they felt. Participants could proceed to the next part of the study only after three minutes. Participants in the attracting, serious, and committed conditions completed five manipulation check items. First, they rated how much they were feeling the emotions of sexual arousal and romantic arousal on seven point Likert-type scales (adopted from Griskevicius et al. 2006a). Then, they rated the extent to which the imagined partner was committed, faithful and safe, each on seven point scales (adapted from Griskevicius et al. 2006a). Participants in the control group completed the sexual and romantic arousal items, but not the imagined partner items since they did not complete the priming task.

Next, I provided an opportunity for participants to exhibit behaviors consistent with the primed evolutionary motive. Participants were asked to imagine themselves at a restaurant eating with an opposite sex person. No details were provided about the nature of their relationship with the hypothetical eating partner, nor whether the eating partner was the same person as imagined in the priming task. The eating style of the eating partner was manipulated. In the unhealthy eating partner condition, the eating partner was

eating a hamburger and French fries, while in the healthy eating partner condition, the partner was eating a chef salad. Participants were then asked what they would order from a menu, a task adapted from Kidwell et al. (2008). The dependent variable was the sum of the calories from all items selected.

Control Measures

Finally, participants completed a series of control measures. All adopted items were measured using the original number of scale points (i.e., nine point scale for the change scale; Wood 2009). Known predictors of calorie consumption were captured. To rule out that unhealthy choices were due to a desire for comfort food, participants completed five items on change in their lives ($\alpha = .81$, nine point scale) and a one item comfort food measure (seven point scale, both adopted from Wood 2009). Objective nutrition knowledge was measured with six items (scored correct/incorrect on items and averaged), and subjective nutrition knowledge was measured with three items ($\alpha = .87$, seven point scale; adopted from Moorman et al. 2004). Participants answered one item regarding personal happiness and eating (how much does eating contribute to happiness in your life, seven point scale, *not at all – very much*). Participants indicated their weight goals (categorical: lose weight, gain weight, maintain weight, or no goal), typical activity level (six point scale, *very sedentary – strenuously active)*, and whether they were on a diet (yes/no). Individual differences related to social interactions were also controlled for including self-monitoring ($\alpha = .85$, 13 items, six point scale; Lennox and Wolfe 1984) and susceptibility to interpersonal influence ($\alpha = .92$, 12 items, seven point scale; Bearden, Netemeyer, and Teel 1989), I also captured characteristics of participants'

current romantic relationships including current status (categorical: *single*, *single and dating*, *in a relationship for less than one year*, *in a relationship for more than one year*, *engaged, married, divorced*) and three continuous items about their current romantic relationship (*seriousness, intensity, satisfaction;* $\alpha = .96$, 100 point sliding scales; combined into a scale; participants not in a relationship indicated zero).

Results

Manipulation and Confounding Checks

ANOVAs were conducted to examine the effectiveness of the evolutionary relationship stage primes and to rule out the second manipulated task, the partner eating style manipulation, as a confounding variable (Perdue and Summers 1986). I expected each of the evolutionary relationship stage primes to generate high levels of romantic arousal and sexual arousal ($r = .68$, analyzed separately) compared to the no prime control condition. In addition, I combined the safe, committed, and faithful variables into a commitment scale ($\alpha = .91$), and I expected increasing commitment ratings for each prime. That is, I expected the commitment ratings in the serious relationship condition to be higher than the attracting a mate condition, and I expected the committed relationship condition to have higher ratings than the serious relationship condition. I conducted 2 (eating partner's eating style: unhealthy, healthy) x 4 (evolutionary relationship stage: attracting a mate, serious relationship, committed relationship, control) ANOVAs for the romantic arousal and sexual arousal dependent variables, and a 2 (eating partner's eating style: unhealthy, healthy) x 3 (evolutionary relationship stage: attracting a mate, serious

relationship, committed relationship) ANOVA for the commitment scale as control participants did not receive the evolutionary relationship stage manipulation.

As expected, for romantic arousal, sexual arousal, and the commitment scale, only the main effects of relationship stage were significant (romantic arousal: $F(3, 696) = 135.14$, $p < .01$); sexual arousal: $F(3, 696) = 48.18$, $p < .01$); commitment scale $F(2, 548) = 86.06$, $p < .01$). The attracting a mate manipulation generated higher romantic arousal and sexual arousal than the control condition (romantic arousal: $M_{attracting} = 5.19$ vs. $M_{control} = 2.41$, $t(700) = 17.07$, $p < .01$; sexual arousal: $M_{attracting} = 4.55$ vs. $M_{control} = 2.47$, $t(700) = 11.50$, $p < .01$). The serious relationship manipulation also generated higher romantic and sexual arousal than the control condition (romantic arousal: $M_{serious} = 5.37$, $t(700) = 16.54$, $p < .01$; sexual arousal: $M_{serious} = 4.32$, $t(700) = 9.34$, $p < .01$). In addition, the commitment rating in the serious relationship condition was higher than in the attracting a mate condition ($M_{serious} = 5.88$ vs. $M_{attracting} = 4.70$, $t(551) = 8.78$, $p < .01$). The committed relationship condition generated higher romantic and sexual arousal than the control group (romantic arousal: $M_{committed} = 5.39$, $t(700) = 16.81$, $p < .01$; sexual arousal: $M_{committed} = 3.91$, $t(700) = 7.33$, $p < .01$). The committed relationship condition had a higher commitment rating than the serious relationship condition ($M_{committed} = 6.36$, $t(551) = 3.28$, $p < .01$). Overall, each prime generated romantic and sexual arousal, commitment increased in each successive relationship stage, and there was no confounding effect of the partner eating style manipulation.

Romantic Relationships and Calories

I conducted a 2 (male, female) x 2 (eating partner's eating style: unhealthy,

healthy) x 4 (evolutionary relationship stage: attracting a mate, serious relationship, committed relationship, control) ANOVA with the sum of calories selected in the menu task as the dependent variable. Cell means are provided in table 4.2, figure 4.1, and figure 4.2. The ANOVA accounted for 6.5% of the variance in calories ($R^2 = .065$, $F(15, 688) = 3.19$, $p < .001$). There were significant main effects of gender ($F(1, 688) = 16.45$, $p < .001$) and evolutionary relationship stage ($F(3, 688) = 5.13$, $p < .01$). The main effect of partner eating style was not statistically significant ($p = .11$). The two-way and three-way interaction terms were not significant, but those results were qualified by specific significant comparisons discussed below.

Before testing my hypotheses, I investigated the gender-specific effects of romantic relationships on calories. I used the 2 (gender) x 2 (partner eating style) x 4 (evolutionary relationship stage) ANOVA. For each gender, I collapsed across the partner eating style and the three romantic primes (attracting, serious, committed), and I compared the effect of the romantic primes to the control group. The contrast was significant for females but not males ($C_{females} = 903$, $t(688) = 3.17$, $p < .01$; $C_{males} = 256$, $t(688) = 1.02$, $p > .10$). Females primed with romantic relationships selected significantly more calories than females in the control condition, while males did not show a significant difference.

Evolutionary Relationship Stages and Calories

Next, I investigated whether specific relationship stages can be danger zones for unhealthy eating. For each gender, I collapsed across the partner eating style and compared each romantic prime to the control condition. Again, I used a 2 (gender) x 2

(partner eating style) x 4 (evolutionary romantic primes) ANOVA. For males, the marginal mean in the serious relationship condition (M = 2892) was 699 calories higher than the control condition (M = 2293), a marginally significant difference ($t(688) = 1.94$, $p = .053$). There was not a significant difference in the attracting a mate vs. control comparison or the committed relationship vs. control comparison. For females, the attracting a mate condition resulted in higher calories than the control condition (C = 790, $t(688) = 2.55$, $p < .05$), as did the serious relationship (C = 1167, $t(688) = 3.28$, $p < .01$) and the committed relationship condition (C = 751, $t(688) = 2.10$, $p < .05$). Males in the serious relationship condition selected more calories than the control group, while females in each of the relationship stage conditions selected more calories than the control group. Romantic evolutionary motives in general may generate danger zones of unhealthy eating for females, while the mate retention motive specifically may generate an unhealthy eating danger zone for males.

Matched Eating Styles in Evolutionary Relationship Stages

To test H1 – H7, I again used a 2 (gender) x 2 (partner eating style) x 4 (evolutionary relationship stage) ANOVA. Matching was tested for each gender and evolutionary relationship stage through pairwise comparisons between the unhealthy partner and healthy partner eating styles. If matching occurred after a prime, I expected the calories for the unhealthy partner group to be significantly higher than calories for the healthy partner group. In the attracting a mate condition, females, but not males, demonstrated matching. There was not a significant difference between males in the unhealthy partner eating style condition and the healthy partner eating style condition (p

= .84), consistent with H1. Females in the unhealthy partner eating style condition had significantly higher calories than females in the healthy partner condition (2397 vs. 1516, $t(688) = 2.43$, $p < .05$), supporting H2. In the serious relationship condition, males, but not females, demonstrated matching. Males in the unhealthy partner eating style condition chose significantly more calories than males in the healthy partner condition (3334 vs. 2451, $t(688) = 2.05$, $p < .05$), supporting H3. There was not a significant difference for females ($p = .80$), consistent with H4. In the committed relationship condition, neither males ($p = .40$) nor females ($p = .78$) demonstrated matching, supporting H5 and H6. In the control groups, neither males (2378 vs. 2207, $p = .70$), nor females (1072 vs. 1260, $p = .71$) demonstrated matching, supporting H7a and H7b.

Covariate Analysis

The results remained the same when controlling for the effects of covariates. The model was tested controlling for measured predictors of calorie consumption: change and desire for comfort food (Wood 2009), objective and subjective nutrition knowledge (Moorman et al. 2004), eating for personal happiness, dieting status, weight goals, and typical activity level. Self-monitoring (Lennox and Wolfe 1984), susceptibility to interpersonal influence (Bearden, Netemeyer, and Teel 1989), and characteristics of participants' current romantic relationships (current status, relationship seriousness scale) were also included. Overall, nine continuous variables and three categorical variables (three dummy codes for weight goal, one dummy code for dieting status, six dummy codes for relationship status) accounted for 6.9% of the variance in calories ($R^2 = .069$, $F(19, 684) = 2.66$, $p < .001$). When added to the model, the 2 (gender) x 2 (partner eating

style) x 4 (evolutionary relationship stage) ANCOVA accounted for an additional 5.9% of the variance in calories (total $R^2 = .128$, $\Delta R^2 = .059$, $\Delta F(15, 669) = 3.02$, $p < .001$). H2 and H3 were supported when tested against controls; females, but not males, matched at the attracting a mate stage ($p < .05$), and males, but not females, matched at the serious relationship stage ($p = .05$). Consistent with H1 – H7, no other cell comparisons were statistically significant.

Discussion

When priming evolutionary relationship stages, I found that females match the eating style of a male eating partner under an attracting a mate relationship prime (H2), but not in the absence of a prime (H7) nor under a serious relationship or committed relationship prime (H4, H6). Conversely, I found that males match the eating style of a female romantic partner under a serious relationship prime (H3), but not in the absence of a prime (H7), nor under an attracting a mate or committed relationship prime (H1, H5). I used a rigorous test controlling for known predictors of calorie consumption and individual difference measures related to social interactions to test my evolutionary motives hypotheses. With my covariate analysis, I showed that evolutionary motives affected calories beyond these variables. Early in a relationship, when the mate acquisition motive is active, females, but not males, will feel evolutionary pressure to match the eating styles of male romantic partners. However, this pressure to match may not last past the early stages. Then, as the relationship becomes more serious, evolutionary motives will guide males to match the eating style of a female romantic partner.

I also uncovered danger zones for unhealthy eating. For females, all three of the romantic relationship stages generated higher calories than the control group. Romantic relationships seem to be a danger zone for unhealthy eating for females, no matter the stage of the relationship. Males face an unhealthy eating danger zone in the serious relationship stage, where I hypothesized the mate retention motive is active. For males, only the serious relationship prime generated higher calories than the control group. In the next study, I extend my findings to consumers in real-life romantic relationships.

STUDY 3: RELATIONSHIPS IN THE REAL WORLD

Overview

In study 3, I sought to extend my findings using a sample of consumers in relationships. Participants provided information about the seriousness of their romantic relationship, a romantic partner's typical eating style, and the participant's typical eating style when eating with the romantic partner. I examined whether participants matched the eating style of romantic partners, and whether the matching pattern was moderated by participant gender and the seriousness of the romantic relationship.

Procedures

For study 3, I used a personal network research design to collect ego network data from participants. In a personal network design, participants, called *egos*, provide data about themselves and about people in their lives, called *alters* (Halgin and Borgatti 2012). The study design enabled me to collect data about an individual's network of

eating partners. Using Amazon Mechanical Turk (Paolacci, Chandler, and Iperiotis 2010), I recruited 540 individuals from the United States who participated in the study for a small payment. I was specifically interested in heterosexual romantic partners, so I filtered the network of eating partners to only participant-romantic partner dyads. Moreover, I filtered the dyadic data a second time to focus on eating behaviors at restaurants (the filtering procedure for restaurant eating is described below). After filtering, the final sample included 162 heterosexual spouse/significant other dyads from 160 unique participants.

Participants began an online survey by providing information about themselves and their relationship. Participants indicated their gender, age, education (1 = *less than high school,* 7 = *doctorate, JD, or MD*), economic status (five point scale, *much lower than most families – much higher than most families*), sexual orientation, and living arrangement (coded as dichotomous, 1 = lives with significant other). Participants rated the seriousness of their current romantic relationship (100 point sliding scale, *not at all serious – very serious*) and rated their personal level of attractiveness (seven point scale, *low attractiveness – high attractiveness*). Descriptive statistics are provided in table 4.4.

Next, participants completed information about their network of eating partners. The section began with a name generator question (Halgin and Borgatti 2012). Participants were asked to name up to six people with whom they eat on a regular basis. Participants could list each person's name, initials, or any other identifying term as long as they could identify each person in the next series of questions. Then participants completed a section about the first person listed (i.e., the first alter). Once the section was complete, participants completed the same items about the second alter, and each

additional alter in turn.

Participants began each alter section by indicating the alter's gender and approximate age. Then, in two questions, participants indicated the nature of their relationship with the alter (*relative, spouse/significant other, roommate, colleague, direct supervisor; acquaintance, friend, close friend*). Participants then completed one item indicating how much they liked the alter (seven point scale, *dislike a lot – like a lot)*, one item rating the physical attractiveness of the alter (seven point scale, *dislike a lot – like a lot*), and one item describing the alter's weight (categorical: *underweight, overweight, obese, healthy weight*). Participants also indicated whether the alter any had eating restrictions or was on a diet.

Next, participants answered an open-ended question indicating where they usually eat with the alter, and a yes/no question asking whether other people, like children, friends, or relatives, generally ate with them (if yes, then participants listed whom in open-ended response). Participants then answered an open response item: please describe a typical meal choice for you when you are eating with (the alter's name). Participants then rated the healthiness of the meal they described on a 100 point sliding scale (0 = unhealthy, 100 = healthy). Next, participants described a typical meal choice for the alter. Participants rated the healthiness of the alter's meal on the same 100 point sliding scale. The absolute value of the difference in these two healthiness scores served as the measure of matching.

A second sample of participants also completed the two meal description and two healthiness rating items specifically for a typical meal at a restaurant. The final dataset included all participants from the second sample and 44 participants from the original

sample who indicated that their typical meal with the relationship partner was at a restaurant. Therefore, all healthiness ratings reflected restaurant eating behaviors.

After providing data about all alters, participants completed control items. Participants completed the self-monitoring scale (α = .87, 13 items, six point scale; Lennox and Wolfe 1984), the susceptibility to interpersonal influence scale (α = .92, 12 items, seven point scale; Bearden et al. 1989), six objective nutrition knowledge items (scored correct/incorrect on items and averaged), three subjective nutrition knowledge items (α = .83, seven point scale; Moorman et al. 2004), and the restrained eating scale (α = .73, 10 items, five point scale coded from 0 to 4; Herman and Polivy 1980).

Results

The dependent variable for study 3 was the healthiness difference score, calculated as the absolute value of the difference between the participant's healthiness rating and the spouse/significant other's healthiness rating. This measure captured the closeness of meal healthiness. A low healthiness difference score indicated matching (H2, H3). A high healthiness difference score indicated independence (H1, H4, H5, H6). I predicted that gender would moderate a cubic effect of relationship seriousness on healthiness difference score. For males, I predicted high healthiness difference scores at low levels of seriousness (H1) and low healthiness difference scores at moderate levels of seriousness (H3). For females, I predicted low healthiness difference scores at low levels of seriousness (H2), and high healthiness difference scores at a moderate levels of seriousness (H4). As seriousness levels increased from moderate levels to high levels, I predicted that both males and females would shift away from their moderate level

positions. That is, in a graph of the cubic relationship, I predicted a bend in the curve between moderate and high seriousness levels. For males, I predicted that the healthiness difference score would be at a minimum at a moderate level of seriousness and would increase up to a maximum before decreasing to a moderate level at high levels of seriousness. For females, I predicted that the healthiness difference score would be at minimum at a low level of seriousness and would increase to a maximum before decreasing to a moderate level at a high level of seriousness.

Covariate Analysis

To test my predicted model, I conducted a series of hierarchical polynomial regressions. The economic status variable was centered at the scale mid-point (3 = *about average*), all continuous predictor variables were mean-centered, gender was dummy coded (1 = *female*), living arrangement variable was coded as a weighted effect (1 = *live with spouse/significant other*), and all other categorical variables were coded as weighted effects. First, the healthiness difference score was regressed on 22 potential covariates (three dichotomous variables, six coded variables representing two categorical sets, and 13 continuous variables). A two-step process was used to determine which covariates to keep for the final model. In step 1, a conservative cut-off of $p < .30$ was used for inclusion ($t(139) > 1.04$ for dichotomous and continuous variables and $F(3, 139) > 1.23$ for categorical sets). Six variables were selected for inclusion. In step 2, the regression structure coefficients of the excluded variables were examined. I expected some predictors to be correlated. Examining regression structure coefficients allowed me to determine if correlation with other variables was lowering *t* values to below the cut-off

point. Regression structure coefficients were calculated as the correlation between the predictor and the dependent variable ($r_{x,y}$) divided by the correlation between all predictors and the dependent variable (R or $\sqrt{R^2}$; Courville and Thompson 2001). Two variables, restrained eating and participant age, had high regression structure coefficients and were included in the model. Analysis of correlations showed that each variable was correlated with a predictor to be excluded (restrained eating with BMI, $r = .39$; participant age with partner age, $r = .89$). Indeed, when I removed the excluded variables and regressed healthiness difference score on the reduced list of covariates, both restrained eating ($t(153) = 1.88$, $p = .06$) and participant age ($t(153) = 1.94$, $p = .05$) met my cut-off criteria. The reduced covariate list, which included seven continuous covariates and one categorical covariate, accounted for 16% of the variance in healthiness difference scores ($R^2 = .16$, $F(8, 153) = 3.63$, $p < .01$).

Gender and Relationship Seriousness

Next, the dummy coded gender variable was entered. Gender did not account for a significant increase in explained variance ($\Delta R^2 = .004$, $\Delta F(1, 152) = .69$, $p = .41$). Then, linear, quadratic, and cubic seriousness terms were added individually to the model. The procedure revealed a marginally significant cubic relationship between relationship seriousness and healthiness difference score (linear: $\Delta R^2 = .001$, $\Delta F(1, 151)$ $p = .65$, quadratic: $\Delta R^2 = .009$, $\Delta F(1, 150) = 1.7$, $p = .20$, cubic: $\Delta R^2 = .016$, $\Delta F(1, 149) = 2.9$, $p = .091$). Finally, three terms representing the interactions between the linear gender variable and the linear, quadratic, and cubic seriousness variables were incrementally added to the model. There was not a significant increase in explained variance for any of the

interaction terms (linear by linear interaction: $\Delta R^2 = .005$, $p = .35$, linear by quadratic interaction: $\Delta R^2 < .001$, $p = .89$, linear by cubic interaction: $\Delta R^2 < .001$, $p = .83$). Therefore, the interaction terms were not included in the model. The final model accounted for 19% of the variance in healthiness difference scores ($R^2 = .19$, $F(12, 149) = 2.91$, $p < .01$). The final model is plotted in figure 4.3 and regression results are provided in table 4.5.

Simple Slopes, Maximum, and Minimum

To test my hypotheses, I examined the shape of the cubic relationship between relationship seriousness and healthiness difference score, the levels of seriousness where the maximum and minimum healthiness difference scores occurred, and the simple slopes of the cubic function. There was neither a main effect of gender nor an interaction between gender and relationship seriousness, so the shape of the curve, the minimum and maximum values, and the simple slopes did not change based on gender. Therefore, I recoded the gender variable as a weighted effect code to center gender at the grand mean across male and female. The weighted effect code was used in all further analysis.

The coefficient of the cubic seriousness term was negative (B = -.001), indicating that the curve was first concave upward then concave downward as relationship seriousness increases (Cohen et al. 2003). To determine the minimum and maximum of the cubic function, I calculated the predicted healthiness difference score for each seriousness value provided by participants. The highest predicted healthiness difference score (19.05) occurred at the lowest seriousness level in the dataset (9), and the lowest predicted difference score (10.66) occurred at the highest seriousness level (100). The

cubic function was at its minimum (12.14) when relationship seriousness was 32. From this minimum level, healthiness difference scores increased to a maximum (18.11) when relationship seriousness was 76.

Next, the simple slope of the cubic function at each value of seriousness was calculated. Each simple slope was tested for statistical significance by dividing the simple slope by its standard error - all $t(149)$. The standard error for each simple slope was the square root of the variance. I calculated the variance for each simple slope by rewriting the simple slope as a linear combination of the original regression coefficients, formatting the linear combination as a row vector, multiplying the row vector by the covariance matrix of the regression coefficients, and multiplying the resulting matrix by the transpose of the original row vector (Aiken and West 1991). There were two regions of seriousness where simple slopes were different from zero. At seriousness levels 47 to 51, the simple slopes ranged from .18 to .20, indicating marginally significant upward slopes (all $p < .10$). From seriousness levels 87 to 100, simple slopes ranged from -.26 to -.70 (all $p < .05$). The slopes in this range were negative, indicating a downward slope trajectory.

Relationship Stages

To evaluate matching patterns in each relationship stage, I divided the 100 point seriousness scale into three equal sections. The attracting a mate stage was designated as the first section (seriousness = 0 to 33.3), the serious relationship stage was the second section (seriousness = 33.3 to 66.6), and the committed relationship stage was designated as the third section (seriousness = 66.6 to 100). Plots of the simple slopes for the starting

point, mid-point, and ending point of each section are provided in figure 4.4. In the attracting a mate stage, healthiness difference scores declined from 19.05 to 12.15, moving from a high level to a low level as seriousness approached the serious relationship stage. This pattern supports the male hypotheses (H1, H3), but not the female hypotheses (H2, H4). Simple slopes were relatively large, but large standard errors prevented them from reaching statistical significance. Matching was most prevalent in the early portion of the serious relationship stage, when difference scores were at their minimum. Then, difference scores gradually increased through the serious relationship stage. In the committed relationship stage, healthiness difference scores reached their peak before exhibiting a downward bend, a result that supports H5 and H6. Following the bend, difference scores sharply declined, indicating a return to a moderate level of matching at the highest seriousness levels.

Discussion

The overall pattern overall results of study 3 offer support H1, H3, H6, and H7. Consistent with the hypotheses for males, matching was strongest at the serious relationship stage. However, the results do not support different matching and independence patterns for males and females. For males, healthiness difference scores decreased as the relationship seriousness increased, indicating an increasing pattern of matching from the attracting a mate stage to the serious relationship stage. Moreover, healthiness difference scores increased from the serious relationship stage to the committed relationship stage. For females, H2 and H4 were not supported. I expected the healthiness difference scores to be lowest for females at low seriousness levels. However,

since the gender effect was not present, the female pattern was identical to the male pattern.

TABLE 4.1
STUDY 1: SELECTED QUALITATIVE RESPONSES

Females	Males
"The guy I am currently dating eats soooo unhealthy. I have a tendency to eat that way at times when I am around him…I cook food for my boyfriend out of love that I usually wouldn't eat because it's usually unhealthy.....lots of grease, no vegetables"	"If my girlfriend is eating unhealthy foods, then I am much more likely to join her." "my girlfriend is very influential on making me eat unhealthy foods, she enjoys them very much"
"My boyfriend can pretty much each anything he wants and it doesn't affect him so he eats a lot of unhealthy foods and when I'm around him I find myself indulging more often… I eat what my boyfriend does part of the time. So I guess you could say that in order to please him I eat where he wants if I can't decide what I really want."	"My wifes cravings for chocolate and ice cream sometime give me the desire to eat them as well." How does the opposite sex influence you to eat unhealthy foods? "a lot my girlfriend loves unhealthy food, yet she is still so skinny "
"the opposite sex does not worry about calories or unhealthy food, so if I am with them then i feel obligated to eat unhealthy" "when they eat it so much, it's hard to deny it." "My boyfriend always makes me eat unhealthy foods because that is generally what he consumes."	"Usually, my girlfriend forces me to forgo unhealthy foods and choose a healthy alternative…I eat less unhealthy food since I've been in a committed relationship"

TABLE 4.2
STUDY 2: EVOLUTIONARY MOTIVE STIMULI

Attracting a Mate Vignette (adapted from Griskevicius et al. 2006a)

Imagine that you are on the last day of your vacation on an exotic island. You and your friends will be flying out tomorrow. You meet someone new - a (woman/man) who you haven't seen before. You are immediately attracted to (her/him). You begin talking with (her/him), and you find that conversation is easy. Before you know it, you have been talking for hours. You decide to spend the afternoon together, and soon afternoon turns to evening. The two of you eat a romantic candlelit dinner at a restaurant overlooking the ocean. When you finish dinner, the two of you walk hand in hand along the beach You kiss gently at first, but soon you find yourselves kissing passionately on the moonlit beach.

Serious Relationship Vignette (adapted from Griskevicius et al. 2006a)

Imagine that you are walking on campus. You meet up with someone. As you see (her/him), you feel exhilarated that you are so attracted to (her/him) after the amount of time that you have been together. You spend the afternoon with (her/him), and conversation comes easy. Soon afternoon turns to evening, and the two of you eat a romantic candlelit dinner. You start thinking about the two of you. (She/he) has met your friends, and they all like (her/him). You have met (her/his) friends, and they all think that you are great together. You think about the future. At the end of the night you gently kiss goodnight. You look forward to the next time that you will be with (her/him).

Committed Relationship Vignette

Imagine that you are just waking up from a good night's sleep. You turn over in your bed and you see a (woman/man). You are not surprised, because this (woman/man) has been your constant companion for the last five years. You go to sleep together every night, and you wake up next to (her/him) every morning. As you look at (her/him), you feel content, and you think about how nice it is that you are still attracted to (her/him) after the amount of time you've been together After you both are awake, you go through your morning routines and get ready for the day. You each grab a quick breakfast from the kitchen. On your way out of the door, you call to (her/him): "Instead of eating at home tonight, do you want to go out and grab dinner?" (She/he) says yes and you head off for work. After your day of work, you are at a restaurant for dinner. Conversation comes easy, as it often does at the dinner table at home. After dinner, you drive home together. Later that night, as you prepare to go to bed, you gently kiss goodnight.

TABLE 4.3
STUDY 2 CALORIES SELECTED IN MENU TASK

	Evolutionary Relationship Stage											
	Attracting a Mate			Serious Relationship			Committed Relationship			Control Group		
Partner Eating Style	*M*	SD	*n*	*M*	SD	*n*	*M*	SD	*n*	*M*	SD	*n*
Male												
Unhealthy Female Partner	2613	2220	55	3334[b]	2595	46	2285	1802	48	2378	2462	42
Healthy Female Partner	2691	1817	55	2451[b]	1914	44	1923	1372	48	2207	1863	42
Female												
Unhealthy Male Partner	2397[a]	1963	65	2397	2186	35	1846	1800	30	1072	1157	33
Healthy Male Partner	1516[a]	1414	62	2269	3575	31	1988	2277	35	1260	1768	33

[a] $t(688) = 2.43$, $p < .05$. [b] $t(688) = 2.05$, $p < .05$.

TABLE 4.4
STUDY 3 DESCRIPTIVE STATISTICS

Dichotomous Measures	*n* Yes	*n* No
Female	91	71
Live with spouse/significant other	90	72
Others eat with the dyad	56	106
Partner on Diet	18	144

Categorical Measures	*n*
Partner's Weight	
Underweight	7
Healthy	96
Overweight	52
Obese	7
Eating Goal	
Lose Weight	90
Gain Weight	10
Maintain Weight	32
No Goal	30

Single Item Measures	*M*	*SD*	Total Possible
Economic Status	3.06	.79	5
Education	4.16	1.30	7
Participant Attractiveness	5.01	1.12	7
Participant Liking of Partner	6.72	.59	7
Partner's Attractiveness	6.10	1.12	7
Relationship Seriousness	85.54	25.18	100
Participant Age	34.13	12.59	*n/a*
Participant BMI calculated from Height and Weight	27.20	6.05	*n/a*
Partner Age	35.46	13.80	*n/a*
Participant Healthiness Rating	55.69	22.83	100
Partner Healthiness Rating	57.36	22.68	100
Healthiness Difference Score	13.12	13.51	*n/a*

Multiple Item Measures	*M*	*SD*	Total Possible	α	Items
Objective Food Knowledge	.47	.18	1	n/a	5
Restrained Eating	14.69	5.49	40	.73	10
Self Monitoring	41.70	10.14	78	.87	13
Subjective Food Knowledge	13.14	3.67	21	.81	3
Susceptibility to Social Influence	36.87	15.20	12	.92	12

TABLE 4.5
STUDY 3 REGRESSION RESULTS

Predictor	B	SE	Beta	*t*	*p*
Intercept	18.55	2.58			
Female[a]	-1.59	2.12	-.06	-.75	.45
Live with spouse/significant other[b]	-1.04	1.22	-.09	-.85	.39
Economic Status	-1.65	1.33	-.10	-1.24	.22
Participant Attractiveness	-1.57	1.02	-.13	-1.54	.13
Participant Liking of Partner	2.99	2.13	.13	1.40	.16
Partner's Attractiveness	-2.23	1.06	-.19	-2.10	.04
Participant Age	-.15	.09	-.14	-1.70	.09
Restrained Eating	.39	.20	.16	2.00	.05
Self Monitoring	.27	.10	.20	2.60	.01
Relationship Seriousness	-.143	.10	-.27	-1.42	.16
Relationship Seriousness^2	-.012	.01	-.97	-2.04	.04
Relationship Seriousness^3	-.0001	.0001	-.77	-1.70	.09

[a]Dummy Code [b]Weighted Effect Code

$R^2 = .19$. DV = Healthiness Difference Score (Absolute Value)

FIGURE 4.1
STUDY 2: MALES – CALORIES SELECTED IN MENU TASK

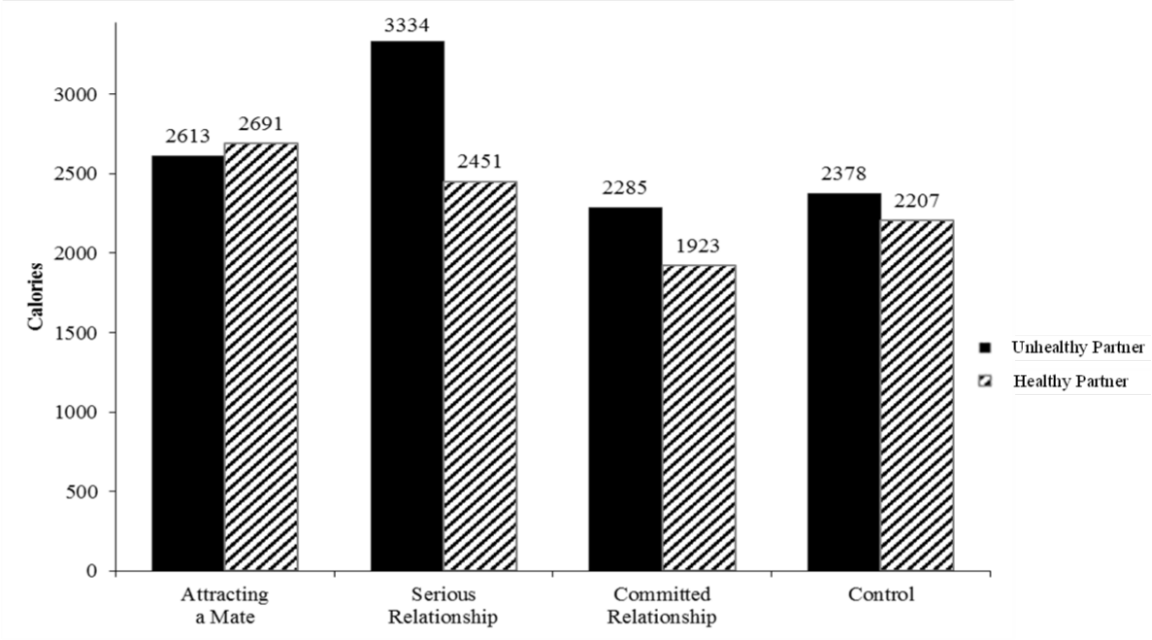


FIGURE 4.2
STUDY 2: FEMALES – CALORIES SELECTED IN MENU TASK

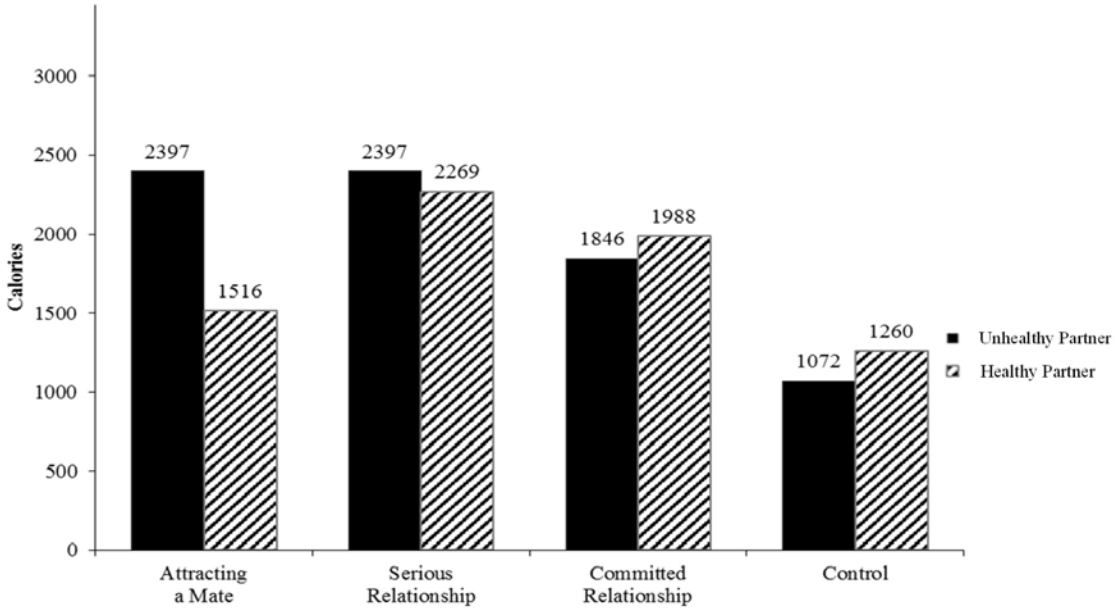


FIGURE 4.3
STUDY 3: CUBIC RELATIONSHIP BETWEEN RELATIONSHIP SERIOUSNESS AND HEALTHINESS DIFFERENCE SCORES

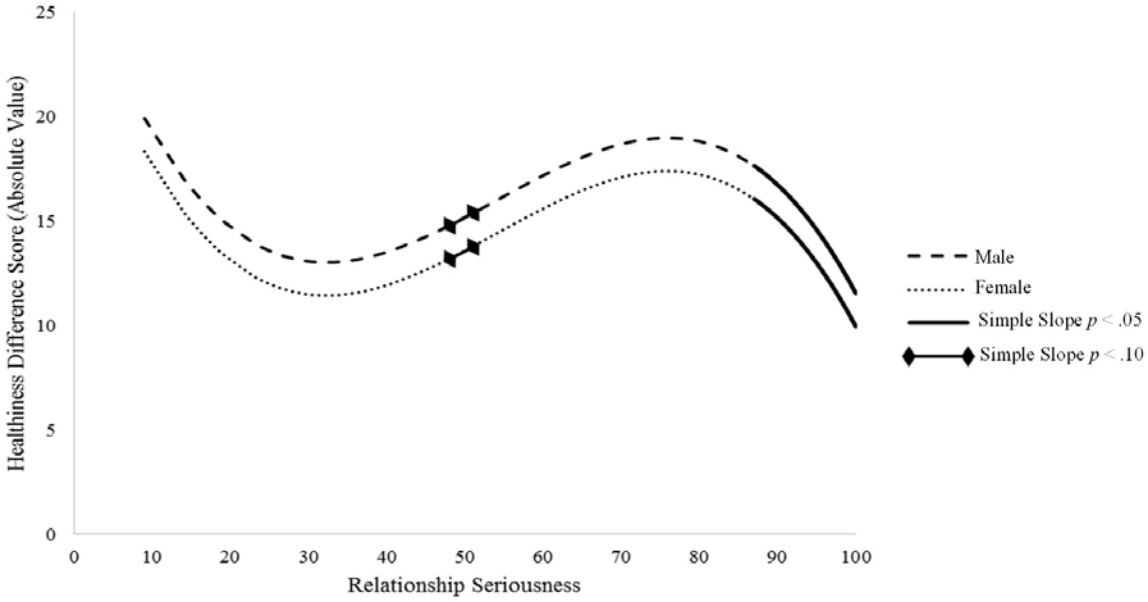
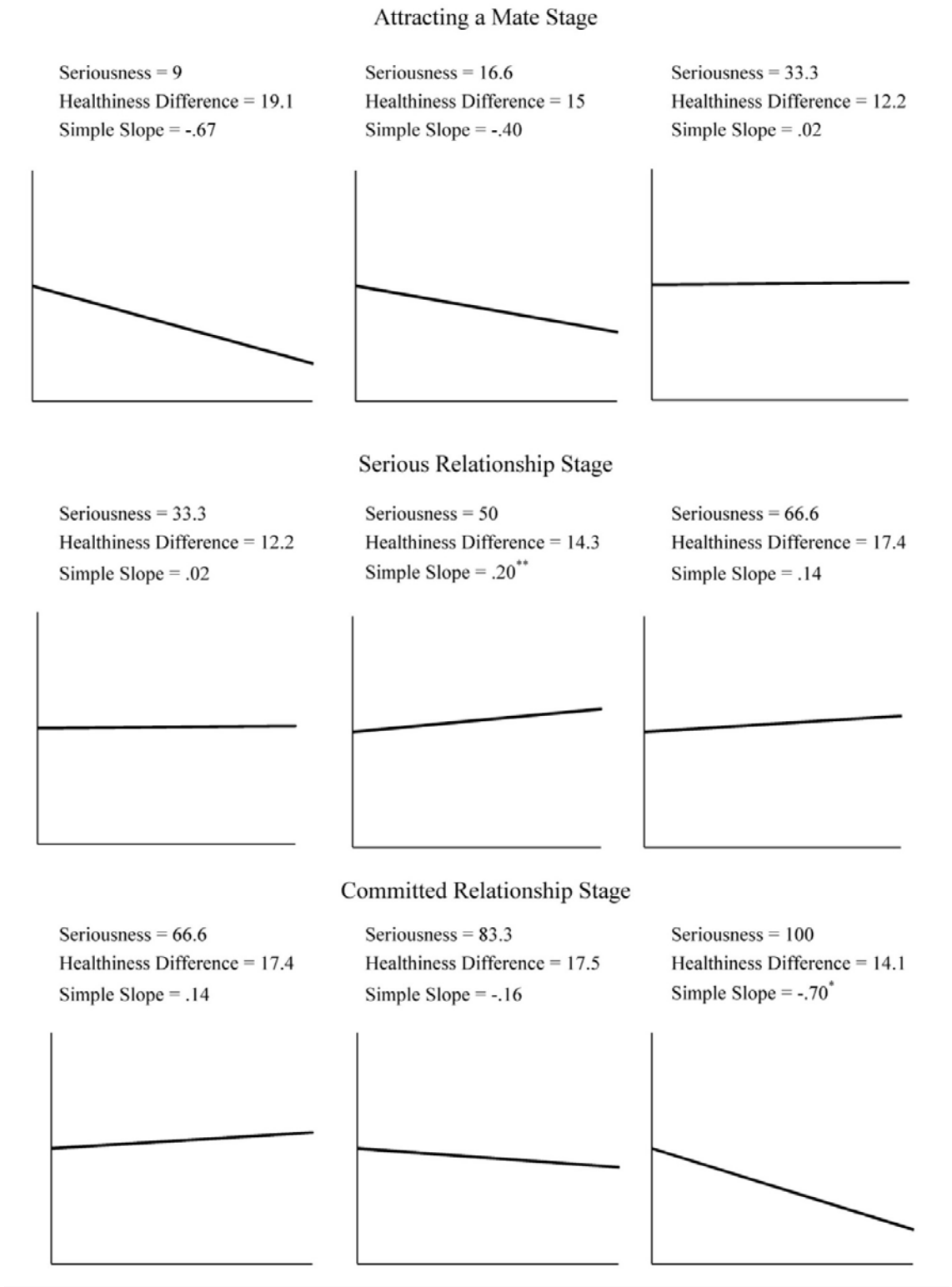


FIGURE 4.4
STUDY 3: CHANGES IN SIMPLE SLOPES ACROSS THREE RELATIONSHIP STAGES



* $p < .10$ ** $p < .05$

CHAPTER FIVE: DISCUSSION

I proposed and tested a model of the gender specific effects of evolutionary motives on romantic partners' food choices. In study 1, I found that the tendency for males to match the healthiness of a female was stronger for males in the serious stage of a relationship than for males in the early stage. In study 2, I found that females and males match the healthiness of romantic partners at different relationship stages. Females match male healthiness in the attracting a mate relationship stage, but not at the serious relationship stage. Males exhibit independence in food choice in the attracting a mate stage and match female healthiness in the serious relationship stage. Both females and males exhibit independence in the committed relationship stage. In study 3 I found that males indeed exhibit independence in the attracting a mate stage and matching as relationship seriousness increases. However, contrary to predictions, I found that the female pattern of matching and independence mirrored the pattern of males.

Theoretical Implications

This research provides novel matching and independence predictions for males and females based on the active evolutionary motive and the stage of a romantic relationship. For ancestral humans and modern consumers, matching a relationship partner provides a way to signal positive qualities and bolster partner commitment. Yet for modern consumers, the difference in the timing of the matching strategy between males and females can result in unintended consequences. A female may match an undesirable behavior, such as unhealthy eating, when attracting a mate, and a male may

match the same undesirable habit as the relationship becomes serious. In this way, a shared obesity pattern between relationship partners can be understood as the outcome of applying a modern matching solution to the evolutionary problems of attracting and retaining a mate.

The difference in the timing of the matching strategy for males and females provides a new theoretical framework for understanding how decision-making patterns emerge in romantic relationships. Mutual agreement in areas like money management, major purchases, and entertainment choices may be the result of one partner matching the other in the attracting and serious relationship stages, and those matched preferences persisting into a committed relationship. Understanding when and how evolutionary motives promote matching and independence can help consumers make better choices for the long-term health of their romantic relationship.

Consumer Implications

Consumers generally attribute shared patterns of weight gain in romantic relationships to increased comfort with a romantic partner. Yet, my research demonstrates that weight gain patterns may be driven by mate acquisition and mate retention evolutionary motives. Shared weight gain may result from females matching the unhealthy patterns of males early in relationships, followed by males matching females as the relationship becomes serious.

Evolutionary motives may also be instrumental in breaking the weight gain cycle. Specifically, adopting healthy eating behaviors at the appropriate relationship stage can promote matching of healthy eating behaviors. Imagine a relationship between an

unhealthy male and a healthy female. The ideal stage to adopt healthy eating behaviors is the serious relationship stage. The most effective way to encourage healthy eating adoption is for the female to eat healthy independent of a male's eating behaviors. The mate retention evolutionary motive will drive the male to match the eating style of the female, and both the male and the female will adopt healthy eating behaviors.

Long-term relationship goals, like a shared healthy eating lifestyle, can be aligned with evolutionary motives at the serious relationship stage. Evolutionary pressures to match will fade at the committed relationship stage. However, other factors like a shared household environment, a shared family budget, and the convenience of eating similar foods may encourage relationship partners to share eating styles. I predict that the shared eating style established at the serious relationship stage will persist into the committed relationship stage, even without evolutionary pressures to match. Therefore, if a female can eat healthy at the serious relationship stage, and a male matches the healthy eating style, then the healthy eating pattern can persist into the committed relationship. In this way, couples can establish a shared healthy lifestyle.

The attracting a mate stage would be the worst time to pursue a conversion to healthy eating. If a male did not want to eat healthy, there would be no evolutionary pressure to match a healthy female. Conversely, if a male were to eat healthy, a female would match, but evolutionary pressure to match would fade at the serious relationship stage. Only if females persisted in healthy eating would there be evolutionary pressure for males to adopt healthy eating long-term.

Therefore, females, ideally with male support, should seek to adopt or maintain healthy eating patterns at the serious relationship stage to establish long-term healthy

eating in the relationship. When discussing future plans, relationship partners should discuss the level of healthiness they desire. Relationship partners should begin eating healthy together long before living together, becoming engaged, or getting married. By doing so, relationship partners can align relationship goals with underlying evolutionary motives to promote positive patterns in long-term relationships.

Finally, for females, romantic relationships seem to be danger zones for unhealthy eating no matter the relationship stage. In the attracting a mate stage, unhealthy eating may be attributable to different body types and social standards for males and females. Males generally carry more weight than females. Weight gain is socially acceptable for males if it is attributed to building strength. Males may naturally eat more, and females, driven by the mate acquisition motive, match the eating styles of males. Moving forward, if couples do not change their eating habits as they enter the serious relationship stage, females may continue to eat unhealthy. Males may also continue to eat unhealthy, unaware that they are matching a female. Therefore, if a couple falls into an unhealthy eating routine in the attracting a mate stage, it is important for females to consciously stop eating unhealthy when reaching the serious relationship stage.

Policy and Marketing Implications

For policymakers addressing the obesity epidemic, the current research provides insights into the timing of promotions to encourage healthy eating. Policymakers should target healthy eating campaigns to relationship partners when they are in the serious relationship stage. Specifically, policymakers should target campaigns to encourage females to adopt healthy eating habits. Compared to other relationship stages, at the

serious relationship stage, males are most amenable to adopting the habits of females. Moreover, the habits that are established at the serious relationship stage are likely to persist into the committed relationship stage.

When policymakers target ads to relationship partners in the committed stage, as they do when they target families, they miss an opportunity to piggyback on the effects of evolutionary motives. By timing promotions with the effect of the mate retention motive, policymakers can strengthen the effects of promotion and increase the chances of healthy eating adoption.

Marketers of healthy food products can also time their promotions to relationship partners in the serious relationship stage. Indeed, marketers of many different products and services can capitalize on the effects of matching to encourage adoption. For marketers, the current research provides a predictable pattern of influence in joint decision making. Females match males early, then males match females as the relationship gets serious. Product preferences that develop in the serious relationship stage are most likely to persist through the committed relationship stage. For instance, the types of foods couples cook together, the restaurants relationship partners choose, the vacation destinations couples prefer, and the movies that partners watch together in the committed relationship stage have likely been influenced by joint preferences established in the serious relationship stage. According to my matching hypothesis, those preferences would have been explicitly chosen or implicitly approved by the female. Therefore, marketers who are targeting couples should focus on couples in the serious relationship stage, then either target females specifically or target females and males for joint product adoption.

Limitations and Future Directions

The current research is not without limitations. Foremost, not all hypotheses were supported in all studies. In study 1, I did not find quantitative support for the prediction that females differed in matching tendencies across relationship stages. Study 1 was exploratory in nature, and the qualitative data aided in theory building. But the survey questions were narrowly focused on unhealthy eating. Asking participants to elaborate on any type of opposite sex influence on eating behaviors may elicit more detailed information about unhealthy and healthy matching. In addition, only two levels of relationship seriousness were coded in study 1. In future studies, it may be beneficial to provide descriptions of the three relationship stages and directly ask participants to identify the stage of their romantic relationship.

In study 3, the gender effect was statistically non-significant. In addition, study 3 did not provide the unhealthy partner/healthy partner comparison that was tested in study 2. In study 3, the healthiness difference score captured how close relationship partners were in healthiness and whether the difference in healthiness changed at different levels of seriousness. However, matching implies that relationship partners are eating at about the same healthiness level. If a female is matching a male, then a male is also matching a female. Whenever the healthiness difference score was low, matching was occurring. However, the measure did not capture who was matching whom.

To measure who was matching whom, I could directly ask if participants are matching their partners. However, evolutionary motives act beyond conscious awareness. Participants may not interpret their behaviors as matching. One solution, and an idea for

future research, is to capture who is matching whom by measuring forbearance. Forbearance is giving up something one wants to do in pursuit of a more important goal. In food choice, forbearance would occur when one partner abandons his or her preferred eating style to match a relationship partner's preferences. Forbearance would be measured by the difference in healthiness ratings when eating with a romantic partner and when eating with someone other than a romantic partner. For females, I would expect a high level of forbearance in the attracting a mate stage. For males, I would expect a high level of forbearance in the serious relationship stage.

In addition to forbearance, the role of parental competence could also be investigated in future research. Parental competence as an attractive quality in a mate is an underexplored concept in evolutionary research. Prior research has established that males are attracted to females who demonstrate kindness, warmth, and agreeableness – traits related to parental nurturance. Males should also be attracted to traits related to parental competence.

The need to demonstrate parental competence may explain why females demonstrate independence under a mate retention motive. Ancestral females faced the problem of loss of male resources. To ensure that males did not redirect their resources, females would have needed to reinforce why males should continue to invest resources in them. Displaying nurturing traits related to parenting could have been one way to reinforce investment Yet, I propose that displaying nurturing traits would not have been enough.

In an ancestral environment, males would have provided resources and females would have taken care of children. A female would have needed to demonstrate to a male

that she was competent of raising offspring who could flourish in order to secure continued resource investment from the male. Qualities like decisiveness, flexibility, and independent decision making would have been desirable. For a female to retain male resources, she would have needed to demonstrate traits of nurturance and parental competence. A matching strategy would demonstrate nurturance. The need to demonstrate competence would drive the independence pattern in the serious relationship stage. Therefore, in future research I can investigate the role of parental competence in the attracting a mate and serious relationship stages.

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Outside Sales Representative, January 2009 – August 2009
Cellular Sales/Verizon Wireless
Columbia, South Carolina

Business Instructor - Adjunct, August 2008 – December 2008
Midlands Technical College
Columbia, South Carolina

Business Instructor, August 2004 – August 2008
Baton Rouge Community College
Baton Rouge, Louisiana

Sales Representative, Facility Services – April 2004 – August 2004
Cintas Corporation
Jackson, Mississippi

Management Trainee, April 2002 – April 2004
Cintas Corporation
Jackson, Mississippi

MBA Student/Graduate Assistant, January 2000 – December 2001
University of Southern Mississippi
Hattiesburg, Mississippi