Job Market Talk

“A Multiple Goal Perspective on Eating Behavior: Decreasing Conflict Between Healthy Eating and an Enjoyable Eating Experience”

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A Multiple Goal Perspective on Eating Behavior: Decreasing Conflict Between Healthy Eating and an Enjoyable Eating Experience

Brief Overview

People often pursue multiple goals, which can conflict with each other. In an eating context, consumers often pursue the goal to eat healthy alongside the goal to have an enjoyable eating experience. I specifically highlight how healthy eating can conflict with an enjoyable eating experience by interfering with two sources of enjoyment in eating experiences: enjoyment derived from the taste of the food itself and enjoyment derived from affiliating with dining companions. Although one way to resolve these conflicts is to focus on one goal at the expense of the other, I take the perspective of decreasing the actual or perceived conflict between goals in my job talk. In Paper 1, I propose “vice-virtue bundles” as a way to decrease the conflict between healthy eating and attaining taste-based pleasure from food. In Paper 2, I establish that a conflict often exists between healthy eating and attaining affiliation-based pleasure during the eating experience and propose ways to decrease the conflict between them.

Paper 1: Vice-Virtue Bundles

Abstract: We introduce a simple solution to help consumers manage choices between healthy and unhealthy food options: vice-virtue bundles. Vice-virtue bundles are item aggregates with varying proportions of both vice and virtue, holding overall quantity constant. Four studies compare choice and perceptions of differently composed vice-virtue bundles relative to one another and to pure vice and pure virtue options. Although multiple consumer segments can be identified, results suggest that people overall tend to prefer vice-virtue bundles with small (1/4) to medium (1/2) proportions of vice rather than large (3/4) proportions of vice. Moreover, people generally rate vice-virtue bundles with small vice proportions as healthier but similarly tasty as bundles with larger vice proportions. For most individuals, choice patterns are different from those predicted by variety-seeking accounts alone. Instead, these findings provide evidence of asymmetric effectiveness of small vice and virtue proportions at addressing taste and health goals, respectively.

Paper 2: Eat, Drink, and Be Merry? Decreasing Conflict Between Healthy Eating and Affiliation

Abstract: Whereas much past research has focused on the conflict between a health goal and a taste goal, we focus on the conflict between a health goal and a social goal. Specifically, we examined how choosing a healthier food can conflict with affiliation with a dining companion who has chosen a less healthy food and how this conflict can be decreased so that choosing healthier food does not conflict with affiliation. In eight studies, we consider dyads of consumers making sequential ordering choices, wherein the first consumer to order (“the indulging consumer”) chooses an unhealthy option and the second consumer to order (“the responding consumer”) faces a choice between an unhealthy option and a healthy option. The first set of studies (Studies 1-3) show that an affiliation goal often leads the responding consumer to choose an unhealthy option, thereby matching the indulging consumer on healthiness. The second set of studies show that choosing an unhealthy option indeed leads to greater affiliation with the indulging consumer (Study 4). Importantly, however, responding consumers can use strategies to decrease this conflict: they can offer to share a healthy choice for variety’s sake (Study 5) or attribute a healthy choice to a health issue (Study 6) and be liked as much as if they had made an unhealthy choice.
Vice-Virtue Bundles

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Data, as supplemental material, are available at http://dx.doi.org/10.1287/mnsc.2014.2053.

Keywords: consumer choice; goal pursuit; bundles; vices; virtues; self-control; health; taste; balancing goals

History: Received October 7, 2013; accepted August 12, 2014, by Yuval Rottenstreich, judgment and decision making.

1. Introduction
Increasing consumers’ tendency to make healthy eating decisions is critical. Current estimates indicate that 68% of American adults are now overweight or obese (Flegal et al. 2010). In addition to having physical and mental health consequences, obesity also has significant economic consequences. To illustrate, obesity is estimated to be responsible for almost 10% of total annual medical expenditures in the United States—approximately $147 billion (Finkelstein et al. 2009). Additionally, for employers that contribute to their employees’ healthcare costs, finding ways to prevent and reduce excess weight gain is critical (Chang and Marsh 2013, Finkelstein et al. 2010, Mello and Rosenthal 2008). Furthermore, many for-profit establishments in the food industry, such as restaurant chains, are also very interested in increasing healthy food sales. Increasing healthy food sales can help such establishments address criticism for the popularity of their traditionally unhealthy offerings (Hastings 2013, Liu et al. 2014) and can be an important component of corporate social responsibility strategies (McDonald’s 2013a, McWilliams et al. 2006).

Unfortunately, the deck is stacked against the choice of healthy options in many ways. First, consumers have limited self-control (Baumeister et al. 1998), and they often find the immediate benefits of tasty indulgences to be more salient than their long-term negative consequences (O’Donoghue and Rabin 2000). In addition, cues that increase hunger and cravings permeate many choice contexts (Laibson 2001, Lambert et al. 1991, Stroebe et al. 2013), making it more difficult for consumers to resist choosing unhealthy foods (Shiv and Fedorikhin 2002). Moreover, many consumers prioritize taste goals over health goals in their food choices (Glanz et al. 1998, Stewart et al. 2006), such that health concerns only affect their food choices once they are confident that taste concerns will also be addressed.

In the present research, we consider the many daily choices that people face between unhealthy, but often tastier, options (such as fries) and healthy, but
often less tasty, options (such as salad). We refer to these unhealthy and healthy options as vices and virtues, respectively, consistent with terminology used in other research on unhealthy and healthy foods (Hui et al. 2009, Mishra and Mishra 2011, Wertenbroch 1998). Although much research has examined interventions aimed at shifting consumers from selecting vice to virtue options, in the present work we focus on simultaneously addressing both taste and health goals.

Specifically, we suggest that *vice-virtue bundles* (offerings in which varying proportions of both vice and virtue are present in a single offering, holding the overall quantity constant (discussed further in §1.2)) represent an opportunity to address taste and health goals within a single choice (Dhar and Simonson 1999, Simonson 1989).

Importantly, depending on the a priori importance that consumers place on addressing taste versus health goals and on their beliefs about the effectiveness of vice and virtue at addressing taste goals, they may choose differently composed bundles. In general, results suggest that for many consumers, the mere presence of vice tends to drastically increase perceptions of an option’s tastiness, raising its perceived effectiveness at addressing a taste goal. For these individuals, bundles that include relatively less vice than virtue are preferred to choices that include relatively more vice than virtue. Thus, for consumers who would otherwise select vice in the absence of vice-virtue bundles, this simple solution may lead to substantially healthier choices.

### 1.1. Existing Solutions to Promote Healthier Eating

Given the strong lure of indulgent foods, numerous strategies have been suggested to curb unhealthy consumption (Chandon and Wansink 2012). One strategy involves increasing access to healthy food options (Keohane 2008, Strom 2013). However, this strategy alone may not be sufficient to significantly increase healthy eating, unless accompanied by cues to increase health awareness (e.g., traffic light symbols) (Sonnenberg et al. 2013), because many consumers will have the option to choose unhealthy options in the same situations in which healthy options are available. Another strategy involves increasing the time between when consumers choose food and when they can consume it (Milkman et al. 2010). However, this strategy may not be implementable in many consumption contexts because it can be difficult to prompt consumers to order food in advance. A third strategy for decreasing unhealthy eating has been to encourage consumers to use moderation—ordering the fries but only eating a few. Yet moderation often fails (Haws et al. 2011) for two reasons: people do not appropriately monitor consumption quantity (Redden and Haws 2013) and a variety of environmental factors inhibit consumption monitoring (Wansink 2004, Wansink et al. 2007). Thus, it may be very difficult to completely shift consumers away from vice consumption.

Other work, however, suggests that consumers may be responsive to external interventions that seek to alter the quantity of vice consumption rather than to eliminate it entirely (Cheema and Soman 2008, Schwartz et al. 2012). For example, research points to the potential for consumers to voluntarily limit vice quantity at the choice stage (Schwartz et al. 2012). Indeed, although consumers regularly consume large amounts of vices (Rolls et al. 2002, Schwartz et al. 2012, Sharpe et al. 2008, Wansink 2006, Wansink et al. 2005) and rarely self-ration by spontaneously requesting to downsize the quantity of vice (Schwartz et al. 2012), they sometimes choose to downsize when a server explicitly asks them if they want to downsize their order (Schwartz et al. 2012).

Furthermore, other research suggests that consumers sometimes embrace opportunities to increase virtue consumption quantity. For example, research suggests that people engage in more exercise if they can listen to enjoyable audiobooks only while exercising, rather than being able to listen at any time, and are willing to pay for this restriction (Milkman et al. 2014); this restriction (termed “temptation bundling”) strategically combines the utility streams from a relative *want* (i.e., enjoyable audiobooks) and a relative *should* (i.e., exercising) (Milkman et al. 2014). In addition, consumers purchase greater quantities of virtuous food products when bonus packs are offered (Mishra and Mishra 2011) and consume more virtuous food products when quantity discounts are offered (Haws and Winterich 2013).

### 1.2. Vice-Virtue Bundles

Given that consumers may accept opportunities to increase virtue consumption under the right circumstances, we suggest a simple solution that can help consumers who would otherwise choose vice to simultaneously increase consumption of healthy foods (virtues) and decrease consumption of unhealthy foods (vices) while still fulfilling taste goals—“vice-virtue bundles.” Vice-virtue bundles consist of nonzero proportions of both vice- and virtue-related products. These proportions can vary, such that a vice-virtue bundle might contain relatively more virtue (e.g., three apple slices and one cookie),
relatively equal proportions of virtue and vice (e.g., two apple slices and two cookies), or relatively more vice (e.g., one apple slice and three cookies).

Importantly, this solution is not equivalent to offering two snacks because the overall portions provided in the bundles are visually and volumetrically equivalent to just one snack (i.e., proportion of pure vice option plus proportion of pure virtue option equals one). Thus, this solution carefully controls overall portions. Indeed, prior research suggests that better health outcomes can be achieved if consumers both limit intake of indulgent foods (Schwartz et al. 2012, Wertenbroch 1998) and increase intake of healthy foods (Redden and Haws 2013). Vice-virtue bundles can help consumers pursue both strategies and provide multifinal means for advancing both taste goals and health goals (Köpetz et al. 2011).

In the present research, we examine the impact on consumers’ choices when vice-virtue bundles varying in terms of the relative proportions of vice and virtue (\(\frac{1}{2}\)-vice and \(\frac{1}{2}\)-virtue; \(\frac{1}{3}\)-vice and \(\frac{1}{3}\)-virtue; and \(\frac{1}{4}\)-vice and \(\frac{1}{4}\)-virtue) are added to a choice set that otherwise would consist of pure virtue (virtue alone) and pure vice (vice alone).

1.3. Maximizing Utility from Addressing Taste and Health Goals

1.3.1. Utility Maximization Function. To understand the effect of introducing vice-virtue bundles to a choice set, consider that consumers are likely to hold both taste and health goals, albeit to different degrees. Although other goals may certainly come into play in making food decisions (e.g., reducing cost), we focus on the trade-offs between health and taste, which are often thought to be in conflict (Raghunathan et al. 2006) and which people often seek to address (Dhar and Simonson 1999). We then suggest that consumers seek to choose the option in a set that best maximizes the sum of the utility they derive from the option’s effectiveness at addressing their taste goal and the utility they derive from the option’s effectiveness at addressing their health goal.

Formally, holding all else constant, consumers tend to choose the option that provides the maximum utility, where the utility of an option A is given by the following equation:

\[
\text{Utility of option A} = (\text{importance of taste goal} \times \text{effectiveness of option A at addressing taste goal}) + (\text{importance of health goal} \times \text{effectiveness of option A at addressing health goal}).
\]

Thus, to predict consumers’ preferences among options, it becomes important to consider consumers’ a priori beliefs about the effectiveness of different options at addressing taste and health goals and to consider the relative importance consumers place on addressing a taste goal and a health goal. Recognizing that these effectiveness beliefs and importance weights may be heterogeneous across consumers leads us to conceptualize three segments of consumers and to develop distinct predictions regarding their response to vice-virtue bundles.

1.3.2. Vice Lovers (Consumer Segment 1). We begin with consumers who we call “vice lovers.” In general, vice lovers represent the typical consumer who, when faced with a self-control dilemma between vice and virtue, tends to choose vice. Vice lovers have two characteristics that are common to many consumers. First, they perceive vices to be tastier than virtues, in keeping with the “unhealthy = tasty intuition” (Raghunathan et al. 2006). That is, vice lovers believe vices are more effective for satisfying taste goals than are virtues. Second, they choose pure vice over pure virtue in the absence of vice-virtue bundles, suggesting that they may place a higher importance on addressing a taste goal than a health goal when both cannot be addressed simultaneously.

Given the first of these two characteristics, we depict in Figure 1(a) these consumers’ functions for an option’s perceived effectiveness at addressing taste and health goals as a function of its relative proportions of vice and virtue. As the proportion of vice in an option increases from 0 to 1, we predict (1) an increasing concave function for the option’s perceived effectiveness at addressing a taste goal and (2) a decreasing linear function for the option’s perceived effectiveness at addressing a health goal.

We predict these functional forms based on prior work on affect and cognition in valuation (Hsee and Rottenstreich 2004). This work theorizes that if people rely more on feelings (or affect) than on calculation (or cognition) to make a judgment, they will be more sensitive to the presence or absence of a stimulus than to the amount of stimulus (Hsee and Rottenstreich 2004). Because tastiness is a primarily affective (feelings-based) attribute (Shiv and Fedorikhin 1999), we anticipate that vice-loving consumers will primarily note whether vice is present or absent. If any vice is present, consumers’ perception that taste goals will be addressed will show an immediate and substantial increase. Furthermore, after this initial present/absent
Figure 1 Theoretical Tastiness and Healthiness Functions for (a) Consumers Who View Vice as More Effective at Addressing a Taste Goal Than Virtue (Vice Lovers and Virtue Acceptors) and (b) Consumers Who Do Not View Vice as More Effective at Addressing a Taste Goal Than Virtue (Virtue Lovers)

Note. These functional forms represent an option’s perceived effectiveness at addressing a taste goal and a health goal as a function of the option’s proportion of vice. In panel (a), an initial increase in vice proportion provides a substantial boost in perceived effectiveness at addressing a taste goal, with subsequent increases in vice proportion providing relatively smaller boosts in perceived effectiveness at addressing a taste goal. In panel (b), an initial increase in vice proportion does not provide a substantial boost in perceived effectiveness at addressing a taste goal (and can actually provide a decrease in perceived effectiveness at addressing a health goal); thus, any selection of vice-virtue bundles among virtue lovers is driven by variety seeking alone. Note that this figure illustrates theoretical predictions for beliefs about the effectiveness of options at addressing taste and health goals, whereas Table 1 additionally illustrates the relative importance of addressing taste and health goals.

Evaluation, returns for greater amounts of vice will diminish, consistent with satiation (Redden and Haws 2013). That is, whereas the first unit of increase in vice proportion produces a large increase in perceived effectiveness at addressing a taste goal, the marginal perceived effectiveness of a vice at addressing a taste goal diminishes quickly, such that additional units of increase in vice proportion do not add much incremental effectiveness. These properties result in an increasing concave pattern for an option’s effectiveness at addressing taste goals as a function of the proportion of vice in an option.

In contrast, for healthiness, this work leads us to predict a decreasing linear pattern for these consumers (Hsee and Rottenstreich 2004), with little or no diminishing returns. Healthiness is a primarily cognitive (calculations-based) attribute (Shiv and Fedorikhin 1999). As a result, when evaluating healthiness, people are more likely to use calculation than feelings (Hsee and Rottenstreich 2004), thus leading to a linear function of proportion of vice in an option. That is, the first unit of increase in virtue proportion does not produce a large increase in perceived effectiveness at addressing a health goal, and the marginal perceived effectiveness of additional units of increase in virtue proportion at addressing a health goal is fairly constant. Therefore, we propose that the effectiveness at addressing a health goal decreases proportionate to the proportion of vice in an option.

To illustrate how these distinct functional forms, along with a relative prioritization of a taste goal over a health goal, can affect preference among vice-virtue bundles, we present constructed numeric example 1 (the vice-lover example) in Table 1. In this example, we use the hypothesized tastiness and healthiness functional forms depicted in Figure 1(a) and make the following additional simplifying assumptions for this segment: the consumer believes that (1) virtue alone is effective at addressing the taste goal and (2) vice alone is effective at addressing the health goal. We also indicate that the vice-lover consumer places a relatively greater importance on addressing a taste goal than on a health goal. Then, assuming that consumers attempt to maximize their utility from addressing taste and health goals, numeric example 1 leads to the prediction that vice lovers may often prefer the ½-vice option. Importantly, because the first unit of increase in vice proportion produces such a large increase in perceived effectiveness at addressing a taste goal, this example also illustrates that in the absence of the ½-vice option, the ½-vice option may often be preferred to the ½-vice option—even though pure vice is preferred to pure virtue in the absence of vice-virtue bundles.

Note that this unique set of predictions for vice lovers cannot be made if we instead assumed a linear tastiness function; a linear tastiness function would lead to the prediction that vice-virtue bundle options with higher proportions of vice (e.g., ½-vice) would be preferred to vice-virtue bundle options with lower proportions of vice.

1.3.3. Virtue Acceptors (Consumer Segment 2). We next consider a second segment of consumers (“virtue acceptors”) who also view vice as tastier (more effective at addressing a taste goal) than virtue.
likely to prefer a vice-virtue bundle with a lower proportion of vice goal importance. Both numeric example 2 in Table 1 and the exam-
ties in the tastiness function: a virtue acceptor may place on addressing a taste goal and a health goal; as relative weights, the sum of the taste goal importance weight and the health goal importance weight is constrained to equal one across all examples. The overall utility of an option is given by the following weighted sum formula: utility of option A = (importance of taste goal \times effectiveness of option A at addressing taste goal) + (importance of health goal \times effectiveness of option A at addressing health goal). We then assume that consumers choose the option that provides the greatest overall utility. We have shaded in gray the preferred option of each consumer segment, based on the numeric values in this table. Note that for virtue lovers, if vice-virtue bundles are selected, then the vice-virtue bundle with the smallest proportion of vice (1/vice option) would be the most popular vice-virtue bundle because of variety seeking, which would call for adding the same number of utils to all vice-virtue bundles (see §1.4).

\[ \text{Total utility of each option} = (a \times b) + (c \times d) \]

Notes. All numbers used are for illustrative purposes; we only make claims about the relative and not the absolute values. The “effectiveness at addressing goal” cells indicate the perceived effectiveness of each of the five options (pure virtue, 1/vice, 1/vice, 1/vice, and pure vice) at addressing taste and health goals, where higher numbers indicate greater perceived effectiveness at addressing a given goal. The “goal importance weights” indicate the relative importance placed on addressing a taste goal and a health goal; as relative weights, the sum of the taste goal importance weight and the health goal importance weight is constrained to equal one across all examples. The overall utility of an option is given by the following weighted sum formula: utility of option A = (importance of taste goal \times effectiveness of option A at addressing taste goal) + (importance of health goal \times effectiveness of option A at addressing health goal). We then assume that consumers choose the option that provides the greatest overall utility. We have shaded in gray the preferred option of each consumer segment, based on the numeric values in this table. Note that for virtue lovers, if vice-virtue bundles are selected, then the vice-virtue bundle with the smallest proportion of vice (1/vice option) would be the most popular vice-virtue bundle because of variety seeking, which would call for adding the same number of utils to all vice-virtue bundles (see §1.4).

but who still choose pure virtue over pure vice in the absence of vice-virtue bundles. To consider how virtue acceptors’ preferences among vice-virtue bundles may differ from vice lovers’ preferences, we suggest that differences in goal importance may explain why a consumer may be a virtue acceptor rather than a vice lover. That is, a virtue acceptor may place relatively greater importance on addressing a health goal than a taste goal.\(^4\) Given these characteristics of virtue acceptors, our prediction of their preference among vice-virtue bundles is presented in constructed numeric example 2 (the virtue-acceptor example) in Table 1.

In numeric example 2, we use the same tasti-
ness and healthiness functions as in numeric exam-
ple 1, thus assuming that a virtue acceptor views
a taste goal as being effectively addressed by vice alone and a health goal as being effectively addressed by vice alone, like a virtue lover. However, rather than assume that the consumer places greater im-
portance on addressing a taste goal than a health goal, we assume that a virtue acceptor places greater importance on addressing a health goal than a taste goal. The greater the relative importance placed on addressing a health goal, the greater the preference for a vice-virtue bundle with a somewhat lower vice proportion. Thus, as shown in numeric example 2, than vice lovers (e.g., a 1/vice option rather than a 1/vice option). Thus, either reason for differentiating virtue acceptors from vice lovers can lead to the same bundle preference prediction for virtue acceptors, and in reality, both reasons may operate.

\(\text{Numeric example 1} \)

<table>
<thead>
<tr>
<th>Segment 1: Vice lovers</th>
<th>Pure virtue</th>
<th>(\frac{1}{2})-vice</th>
<th>(\frac{1}{2})-vice</th>
<th>Pure vice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness at addressing taste goal (a)</td>
<td>0</td>
<td>23</td>
<td>33</td>
<td>40</td>
</tr>
<tr>
<td>Taste goal importance weight (b)</td>
<td>0.55</td>
<td>0.55</td>
<td>0.55</td>
<td>0.55</td>
</tr>
<tr>
<td>Effectiveness at addressing health goal (c)</td>
<td>40</td>
<td>40</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>Health goal importance weight (d)</td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
</tr>
<tr>
<td>Total utility of each option (a x b) + (c x d)</td>
<td>18.00</td>
<td>26.15</td>
<td>27.15</td>
<td>25.40</td>
</tr>
</tbody>
</table>

\(\text{Numeric example 2} \)

<table>
<thead>
<tr>
<th>Segment 2: Virtue acceptors</th>
<th>Pure virtue</th>
<th>(\frac{1}{2})-vice</th>
<th>(\frac{1}{2})-vice</th>
<th>Pure vice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness at addressing taste goal (a)</td>
<td>0</td>
<td>23</td>
<td>33</td>
<td>40</td>
</tr>
<tr>
<td>Taste goal importance weight (b)</td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
</tr>
<tr>
<td>Effectiveness at addressing health goal (c)</td>
<td>40</td>
<td>40</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>Health goal importance weight (d)</td>
<td>0.55</td>
<td>0.55</td>
<td>0.55</td>
<td>0.55</td>
</tr>
<tr>
<td>Total utility of each option (a x b) + (c x d)</td>
<td>22.00</td>
<td>26.85</td>
<td>25.85</td>
<td>22.60</td>
</tr>
</tbody>
</table>

\(\text{Numeric example 3} \)

<table>
<thead>
<tr>
<th>Segment 3: Vice lovers</th>
<th>Pure virtue</th>
<th>(\frac{1}{2})-vice</th>
<th>(\frac{1}{2})-vice</th>
<th>Pure vice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness at addressing taste goal (a)</td>
<td>40</td>
<td>40</td>
<td>35</td>
<td>31</td>
</tr>
<tr>
<td>Taste goal importance weight (b)</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>Effectiveness at addressing health goal (c)</td>
<td>40</td>
<td>40</td>
<td>38</td>
<td>31</td>
</tr>
<tr>
<td>Health goal importance weight (d)</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>Total utility of each option (a x b) + (c x d)</td>
<td>40.00</td>
<td>35.00</td>
<td>29.00</td>
<td>15.50</td>
</tr>
</tbody>
</table>

\(\text{Table 1: Constructed Numeric Examples for Weighted Sum Model of Choice Among Vice-Virtue Bundles for Three Consumer Segments (Vice Lovers, Virtue Acceptors, and Virtue Lovers)}\)
the presence of vice-virtue bundles. Still, we can make the same predictions about virtue lovers’ preferences in the absence of vice-virtue bundles, perhaps because virtue acceptors prioritize their health goal more than vice lovers do. As numeric example 2 clearly illustrates, virtue acceptors are then likely to prefer a vice-virtue bundle with a lower proportion of vice than vice lovers prefer (e.g., a $\frac{1}{4}$-vice option rather than a $\frac{1}{2}$-vice option).

1.3.4. Virtue Lovers (Consumer Segment 3). Thus far, we have discussed the majority of consumers—the large proportion who generally view vice as tastier than virtue (Raghunathan et al. 2006). However, note that there may be a third segment of consumers (“virtue lovers”) who do not view a vice as tastier than a virtue and may actually, on average, view a virtue as tastier than a vice (Werle et al. 2013). That is, they simply love the taste of a virtue (e.g., salad). We depict the tastiness and healthiness functions that we would anticipate for these consumers in Figure 1(b).

For virtue lovers, pure virtue can meet both taste and health goals. Thus, increasing the proportion of vice from 0 to 1 will tend to undermine both goals simultaneously. In other words, as illustrated in constructed numeric example 3 (the virtue-lover example), a small increase in vice proportion provides no substantial boost in taste utility for these consumers because both tastiness and healthiness are decreasing functions of the proportion of vice. Instead, when vice-virtue bundles are introduced, the only reason these consumers would introduce vice into their bundle would be to variety seek (discussed in §1.4; Inman 2001, Kahn and Wansink 2004). Moreover, virtue lovers’ chosen vice-virtue bundles will likely contain only a small proportion of vice, given that a small proportion of vice allows variety seeking without producing large decreases in health and potential decreases in taste.

1.3.5. Summary of Hypotheses. In Figures 1(a) and 1(b) and Table 1, we summarize our hypotheses about the tastiness and healthiness functions and the corresponding predictions about preference for vice-virtue bundles for each segment. These three consumer segments consist of the two segments of consumers who believe virtue tastes better than vice (vice lovers and virtue acceptors) in Figure 1(a)—but who may differ in their prioritization of taste and health goals (see also numeric examples 1 and 2 in Table 1)—and one segment that does not believe vice tastes better than virtue (virtue lovers in Figure 1(b)—thereby removing the need to use vice-virtue bundles for balancing taste and health goals, but still allowing for variety seeking to operate (see also numeric example 3 in Table 1).

Our theoretical framework thus suggests that adding vice-virtue bundles can have differential effects on consumers’ caloric intake depending on which consumer segment they belong to. Specifically, adding vice-virtue bundles should substantially decrease caloric intake for consumers who choose pure virtue in the absence of vice-virtue bundles (vice lovers). However, for consumers who choose pure virtue in the absence of vice-virtue bundles (virtue acceptors and virtue lovers), introducing vice-virtue bundles may slightly increase caloric intake.

1.4. Alternative Explanations for Vice-Virtue Bundle Preferences

A simple variety-seeking account suggests that people may derive additional utility from vice-virtue bundles over pure options. Specifically, a variety-seeking account would assume that pure virtue and pure vice options do not address a variety goal, whereas all vice-virtue bundles address a variety goal to the same extent (Drewnowski et al. 1997). First, we consider whether explicitly accounting for a variety-seeking goal in the utility function would affect the predicted preferred options for vice lovers and virtue acceptors, as indicated by numeric examples 1 and 2 in Table 1. If we simply added $x$ (where $x > 0$) utility to each of the vice-virtue bundles but not the pure options (to indicate added utility from addressing a variety-seeking goal), there would be no difference in the predicted preferred option. The only difference in the predicted preferred option would be for virtue lovers in numeric example 3, who would prefer the $\frac{1}{4}$-vice option over the pure virtue option as long as $x > 5$. Second, we consider whether accounting for a variety-seeking goal alone could lead to the same predicted preferred options for vice lovers and virtue acceptors, as indicated by numeric examples 1 and 2 in Table 1. That is, if we assume an increasing linear tastiness function rather than an increasing concave tastiness function, can variety-seeking lead to the same predictions as assuming an increasing concave tastiness function? The answer is no. Although adding utility to all vice-virtue bundles can lead to the prediction that virtue acceptors prefer a $\frac{1}{4}$-vice option, it...
leads to the prediction that vice lovers would prefer a $\frac{3}{4}$-vice option. Thus, we argue that a variety-seeking account can (and should) account for our predictions for virtue lovers but cannot explain our predictions for vice lovers in particular, because it would predict preference for a vice-virtue bundle with relatively more vice.

Second, the existing finding that adding a small virtue (e.g., a tomato slice) to a larger vice (e.g., a hamburger) decreases perceptions of the caloric content of the meal (Chernev 2011, Chernev and Gal 2010) also cannot account for our predictions. This prior work focuses on adding smaller virtues to larger vices, which is most analogous to a vice-virtue bundle with relatively more vice than virtue, and thus would suggest the popularity of a vice-virtue bundle with relatively more vice than virtue. In contrast, we predict—because of the increasing concave tastiness function—that a vice-virtue bundle with relatively more vice than virtue will typically be less popular than vice-virtue bundles with lower vice proportions.

2. Overview of Studies
First, in Studies 1 and 2, we tested the effects of vice-virtue bundles by first examining whether people select vice-virtue bundles, what proportions of vice and virtue people prefer in vice-virtue bundles (1-vice, 1-vice, or 3-vice), and whether people consume the options they select. We also checked whether offering vice-virtue bundles changes subsequent consumption. Together, these studies yield the interesting conclusion that although we examined situations in which choice share of pure vice and pure virtue were not different when only pure options were offered, offering vice-virtue bundles tends to lead consumers to choose options that offer 1-vice or 1-vice. In addition, the results of Study 2 suggest that offering vice-virtue bundles may decrease subsequent caloric consumption.

Second, in Study 3, we directly tested the forms of the tastiness and healthiness functions that we proposed might underlie choices of vice-virtue bundles. We do this by measuring consumers’ ratings of the tastiness and healthiness for different vice-virtue bundles and pure options.6 We examined these ratings, and relative preferences among vice-virtue bundles, separately by consumer segment.

Third, in Study 4, to demonstrate that the choice patterns that we predict for the vice-lover segment in particular cannot be explained by pure variety seeking, we tested the impact of removing the 1-vice option—the vice-virtue bundle option that tends to be chosen by the vice-lover segment when available—from the vice-virtue bundles offered. Our results indicate that in the absence of the 1-vice option, vice lovers exhibit preference shifts; consumers who would have selected a particular pure option (i.e., pure vice in the case of vice lovers) in fact select an option that contains less than half of that particular pure option when bundles are introduced (i.e., they select 1-vice). We compared the introduction of vice-virtue bundles to the introduction of vice-virtue bundles, which also provide variety but do not provide an opportunity to balance goals. Our results indicate that in the absence of the middle vice-virtue bundle option, preference shifts are much less likely to occur. These findings suggest that when vice-virtue bundles are offered, variety seeking does not drive choice for vice lovers; rather, the hypothesized substantial increase in taste utility provided by incorporating a small proportion of vice clearly drives choice for them.

It was also important to consider how the introduction of vice-virtue bundles affects caloric consumption. In Studies 1 and 2, our between-subjects design allows us only to observe a null effect in the aggregate. However, note that changes in aggregate caloric consumption depend heavily on the relative proportions of the different consumer segments. Thus, in Studies 3 and 4, we use a within-subjects design that allows us to segment consumers and observe differential changes in caloric consumption based on consumer segment. For vice lovers, we predict a relatively larger decrease in calories as they shift from pure vice to 1-vice; in contrast, for virtue acceptors and virtue lovers, we predict a relatively smaller increase in calories as they shift from pure virtue to 1-vice.

2.1. Study 1: Choice Among Vice-Virtue Bundles
Study 1 uses a between-subjects design to compare actual choice when vice-virtue bundles are included versus not included in a choice set. The main purpose of this study is to examine whether consumers choose vice-virtue bundles and, if so, which bundles they prefer.

2.1.1. Method.
Participants and Design. Seventy participants (40.0% female) were recruited from a university’s annual weekend event in which graduate students camp out for college basketball tickets. The weekend event was held from Friday evening to Sunday morning. Data were collected on Saturday afternoon, ending at 6:15 p.m., when the basketball coach arrived to make a speech.

Participants were randomly assigned to one of two choice sets: (1) “pure vice–pure virtue” (a two-option
choice set with pure virtue and pure vice) or (2) “vice-virtue” (a five-option choice set with pure virtue, \( \frac{1}{4}\)-vice, \( \frac{1}{2}\)-vice, \( \frac{3}{4}\)-vice, and pure vice). Eight participants were excluded from analysis for the following reasons: two said they did not want a snack, and six observed another participant’s snack choice by inadvertently seeing or overhearing another participant’s snack choice.7

Procedure. Researchers approached participants who were alone or in relatively small groups and asked them to participate in a brief survey in exchange for a snack. Participants were told that we had two different sets of survey questions and that they needed to reach into an envelope and pick out a slip of paper that either had the number “1” or “2” printed on it; this number corresponded to the choice set they received. Thus, although researchers selectively approached participants, this randomization ensured no systematic bias was generated across conditions.

Depending on randomly assigned condition, participants were shown a choice set consisting of two options or five options. The pure virtue and vice options were, respectively, baby carrots and potato chips. The mixed vice-virtue bundles included a \( \frac{1}{4}\)-vice option (\( \frac{1}{4}\) baby carrots and \( \frac{1}{4}\) potato chips), a \( \frac{1}{2}\)-vice option (\( \frac{1}{2}\) baby carrots and \( \frac{1}{2}\) potato chips), and a \( \frac{3}{4}\)-vice option (\( \frac{3}{4}\) baby carrots and \( \frac{3}{4}\) potato chips). These choice options were presented pictorially (see Figure A.1 in the appendix). For the precise food contents (i.e., grams of baby carrots and potato chips) and calories on each plate, see Figure A.2 in the appendix.

Participants chose one option from their assigned choice set and received a voucher that allowed them to redeem it for their chosen snack from a researcher stationed next to a cooler of snacks.

2.1.2. Results and Discussion.

Choice Share. Table 2 shows the percentage of participants who selected each snack in each condition. In the pure vice–pure virtue choice set, the choice shares were not significantly different (\( p = 0.163, \) exact binomial test). In the vice-virtue bundle choice set, 24.1% chose pure virtue, 37.9% chose \( \frac{1}{4}\)-vice, 31.0% chose \( \frac{1}{2}\)-vice, 3.4% chose \( \frac{3}{4}\)-vice, and 3.4% chose pure vice.

Both the \( \frac{1}{4}\)-vice option and the \( \frac{1}{2}\)-vice option were significantly more likely to be chosen than the \( \frac{3}{4}\)-vice option (\( p = 0.006 \) and \( p = 0.022 \), respectively, exact binomial tests). The \( \frac{1}{4}\)-vice option and the \( \frac{1}{2}\)-vice option drew similar choice shares (37.9% and 31.0%; \( p = 0.824 \), exact binomial test).

Calories Ordered. We also calculated calories ordered (see Figure A.2). Calories ordered was not significantly different when vice-virtue bundles were introduced (\( M_{\text{option}} = 74 \) calories, \( M_{\text{choice}} = 79 \) calories; independent-samples \( t \)-test: \( t(48) = 0.46, p = 0.648^8 \) nonparametric Mann–Whitney \( U \)-test: \( p = 0.346 \)).

Discussion. These results provide initial evidence that people select vice-virtue bundles when making actual food choices. We found choice shares among the vice-virtue bundles that were consistent with aggregate choice patterns predicted by a combination of asymmetric effectiveness of small vice and virtue proportions (for vice lovers and virtue acceptors) and variety seeking (for virtue lovers). Specifically, both the \( \frac{1}{4}\)-vice and \( \frac{1}{2}\)-vice options were more popular than the \( \frac{3}{4}\)-vice option.

We note that, in the aggregate, we observe no decrease in the average number of calories ordered when vice-virtue bundles were introduced. However, our theory predicts that the effects of introducing vice-virtue bundles on calories ordered at the aggregate level will depend on the relative proportion of people who would otherwise choose vice in the absence of vice-virtue bundles (vice lovers) and those who would otherwise choose virtue in the absence of vice-virtue bundles (virtue acceptors and virtue lovers). Because our between-subjects design in Study 1 does not allow us to observe participants’ a priori preferences, we cannot test for this differential effect by consumer segment. We elaborate on this limitation further in the discussion of Study 2. Then, when this limitation is lifted in Studies 3 and 4, we examine how the effect of introducing vice-virtue bundles on calories ordered differs by consumer segment.

We also note that in Study 1, we did not actually observe participants’ consumption, either during or after the experiment. Therefore, it is possible that participants did not actually consume the options they selected. It is also possible that offering vice-virtue bundles might affect consumers’ subsequent caloric intake. Examining this latter possibility is important because if offering vice-virtue bundles were to lead to higher subsequent caloric intake, then this intervention could in fact have perverse, negative effects on healthy eating initiatives. We test these possibilities in Study 2.

2.2. Study 2: Choice and Consumption of Vice-Virtue Bundles

In Study 2, we aimed to replicate the choice share findings of Study 1 with a different set of snacks while also measuring whether people actually consume the snacks they select. In addition, we collected

7 The choice patterns observed are largely robust to including the six participants who observed another participant’s snack choice. See the online appendix (available as supplemental material at http://dx.doi.org/10.1287/mnsc.2014.2053) for additional details.

8 The degrees of freedom were adjusted because of the heterogeneity of variances.
dietary recall data to examine whether offering vice-virtue bundles alters subsequent (post-snack) caloric consumption.

### 2.2.1. Method.

**Participants and Design.** One hundred participants ($M_{age} = 21.83, 63.0\%$ female) from a university participant pool took part in this study,\(^9\) which contained two parts. Participants were eligible to complete part 2 if they completed part 1 on the previous day. Of the 100 participants who completed part 1, 86 participants (86.0\%) also completed part 2 the next day. Participants received $\$5$ if they only completed part 1 and $\$15$ if they completed both parts. Part 1 was administered in 20-minute sessions between 1:30 p.m. and 4:30 p.m. Part 2 was administered in 20-minute sessions between 9:00 a.m. and 1:00 p.m.

As in Study 1, participants were randomly assigned to one of two choice-sets: (1) “pure vice–pure virtue” (a two-option choice set with pure virtue and pure vice) or (2) “vice-virtue” (a five-option choice set with pure virtue, \(\frac{1}{2}\)-vice, \(\frac{1}{3}\)-vice, \(\frac{1}{4}\)-vice, and pure vice). Five participants were excluded from all analyses because of dietary restrictions (two participants reported an allergy to apples, the virtue product used in this study; one reported an allergy to wheat/gluten, an ingredient in the vice product used in this study; two reported that they do not eat chocolate, an ingredient in the vice product used in this study), thus leaving us with 95 participants for the analysis of snack choice and 81 participants for the dietary recall analysis.

**Part 1 Procedure.** Participants were told that part 1 would involve listening to an audio program and that they would be provided with a snack. Participants entered the lab in groups of up to eight, and each participant took a seat at an individual computer station. Dividers were placed between computer stations to keep participants from observing other participants’ food choices and consumption.

Participants first selected one of two audio programs to listen to. In actuality, both audio programs were the same to ensure that all participants had the same listening experience, but the programs were labeled with different titles to facilitate the cover story that we were interested in their audio listening experience (rather than their food choices and consumption).

Based on randomly assigned condition, participants were shown a choice set with two or five options.

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\(^9\) For Studies 2–4, we set target sample sizes prior to data collection and analysis (Simmons et al. 2011). For Study 2, we aimed for approximately the same number of participants as in Study 1 but used a slightly larger sample size to account for potential attrition for the follow-up dietary recall part of the study. For Study 3, we aimed for approximately 100 participants, consistent with the number of participants in the vice-virtue 50/50-included choice 1 condition in Study 4. For Study 4, we aimed for 100 participants per between-subjects condition.
The virtue and vice options were, respectively, apple slices and Oreo cookies. The vice-virtue bundle options were \(1\)-vice (three apple slices and one Oreo), \(2\)-vice (two apple slices and two Oreos), and \(3\)-vice (one apple slice and three Oreos). These choice options were presented pictorially (see Figure A.1). For the food contents (grams of apples and Oreos) and calories on each plate, see Figure A.2.

Participants circled their selections on a sheet of paper and handed them to a researcher (hereafter “the main researcher”). The main researcher then instructed participants to complete a filler survey about headphone preferences and entertainment preferences. While participants completed the filler survey, researchers stationed in a second room prepared the snacks selected by participants. To allow us to keep track of how much each participant consumed, the bottom of each snack dish was discretely labeled to allow us to link each participant’s consumption with the rest of the data he or she provided. The main researcher then served participants their selected snacks. The main researcher told participants to begin watching the audio clip and that they could feel free to eat the snack until the researcher returned in approximately 10 minutes.

The main researcher returned after approximately 10 minutes and collected participants’ dishes and any leftovers. The researchers in the second room then recorded whether participants had any leftovers and, if so, what the leftovers were.

Finally, participants provided demographic information and entered a unique ID to allow linking of their data across parts 1 and 2 of the study. Participants were reminded to return the following day for part 2 of the study. They were not told that they would be completing a dietary recall for part 2 because we did not want to alter their post-snack consumption behavior.

**Part 2 Procedure**. When participants returned the next day, they were told that the purpose of part 2 of the study was to gather information on what foods and drinks they had consumed yesterday from when they woke up to when they went to sleep. A three-step multiple-pass recall, adapted for group administration, was used to assess what participants had consumed (Guenther et al. 1997, Scott et al. 2007). During the first pass (quick list), participants listed all foods and beverages they consumed yesterday from when they woke up to when they went to sleep. During the second pass (detailed description), participants added detailed information about each food or beverage, including when they consumed it, the portion size consumed, and any brand names. Participants were provided with measurement estimation guides to help them estimate portion size, a folder of menus from local restaurants to help them recall exact dishes that they might have eaten, and a sheet of paper with seven questions to help them add more detail to their dietary recalls (Scott et al. 2007). During the third and final pass (review), a researcher reviewed the participant’s dietary recall to check for completeness. Of interest to the present research, this dietary recall included information on participants’ food and beverage consumption in the afternoon and evening following part 1’s snack session.

**Dietary Recall Coding**. Calories consumed in the afternoon and evening following the snack session were calculated using the dietary recalls, online databases containing calorie information for different foods (e.g., http://caloriecount.about.com, http://www.fatsecret.com, and http://www.myfitnesspal.com), and nutrition information on restaurant and product websites.

**2.2.2. Results and Discussion**. First, we examine the choice shares when vice-virtue bundles were introduced to the choice set. Second, we examine whether participants consumed their chosen snacks. Finally, we examine post-snack caloric consumption to examine whether introducing vice-virtue bundles alters subsequent consumption.

**Choice Share**. Table 2 shows the percentage of participants who selected each snack in each condition. In the pure vice–pure virtue choice set, the choice shares were not significantly different \(p = 0.104\), exact binomial test). In the vice-virtue bundle choice set, 22.4% chose pure virtue, 22.4% chose \(1\)-vice, 40.8% chose \(2\)-vice, 4.1% chose \(3\)-vice, and 10.2% chose pure vice.

The \(1\)-vice option was significantly more likely to be chosen than the \(3\)-vice option (22.4% versus 4.1%; \(p = 0.023\), exact binomial test), and the \(2\)-vice option was significantly more likely to be chosen than the \(3\)-vice option (40.8% versus 4.1% \(p < 0.001\), exact binomial test). The \(1\)-vice option and the \(2\)-vice option drew similar choice shares (22.4% and 40.8%; \(p = 0.150\), exact binomial test).

**Consumption**. The majority of participants (89.5%) consumed the entire snack they selected. The percentage consuming the entire snack did not differ across conditions; 87.0% of participants in the two-option choice set condition consumed the entire snack, and 91.8% of participants in the five-option choice set condition consumed the entire snack \(p = 0.441\), two-proportion Z-test). Of the six participants who did not consume the entire snack in the two-option choice set condition, two had some apple leftover and four had some cookie leftover. Of the four participants who did not consume the entire snack in the five-option set condition, two had some apple leftover and two had some apple and some cookie leftover.

**Snack Caloric Consumption**. We then calculated the calories consumed at part 1’s snack session (see
Figure A.2). Calorie consumption during the snack session was not significantly different when vice-virtue bundles were introduced ($M_{option} = 103$ calories, $M_{2option} = 91$ calories; independent-samples $t$-test: $t(79) = 0.85$, $p = 0.396$; nonparametric Mann–Whitney $U$-test: $p = 0.063$).

Post-snack Caloric Consumption. We then analyzed the dietary recall data to examine whether introducing vice-virtue bundles affected subsequent post-snack caloric consumption. The percentage of participants completing a dietary recall did not differ across conditions: 89.1% of participants in the two-option choice set condition completed a recall, and 81.6% of participants in the five-option choice set condition completed a recall ($p = 0.303$, two-proportion Z-test). An independent samples $t$-test indicated that post-snack caloric intake was lower when vice-virtue bundles were introduced ($M_{option} = 886$ calories vs. $M_{2option} = 1,112$ calories; $t(79) = 2.03$, $p = 0.045$). Including snack calories consumed, the comparison was marginally significant ($M_{option} = 992$ calories vs. $M_{2option} = 1,204$ calories $t(79) = 1.90$, $p = 0.062$).

Discussion. Using a different set of stimuli with countable units, Study 2 replicated the choice share findings of Study 1. Specifically, we again find that when vice-virtue bundles are introduced, participants tended to choose vice-virtue bundles with proportions of vice that were $\frac{1}{2}$ or less. In addition, Study 2 demonstrated that most participants consumed the entire option they selected. Thus, it appears that participants’ choices were well calibrated with their actual consumption and that offering vice-virtue bundles will not increase food waste (i.e., lead consumers to select but not consume virtues). Moreover, Study 2 found that offering vice-virtue bundles appears to lead consumers to decrease their subsequent caloric intake. We discuss this finding more in §3.3.

Finally, analogous to Study 1, no aggregate decrease in snack calories consumed occurred when vice-virtue bundles were introduced. However, our theory predicts that the aggregate-level effects of introducing vice-virtue bundles on calories ordered and consumed will depend heavily on the relative proportions of the three consumer segments in the population. Thus, in Studies 3 and 4, we conduct a more precise examination of the impact of introducing vice-virtue bundles on calories ordered by examining the calorie implications separately for people who would otherwise choose pure vice and people who would otherwise choose pure virtue in the absence of vice-virtue bundles.

2.3. Study 3: Perceptions of Vice-Virtue Bundle Options

In Study 3, we test the theoretical predictions in Figures 1(a) and 1(b) and Table 1. All participants were asked to rate the perceived tastiness and healthiness of five options (pure virtue, pure vice, and three vice-virtue bundles). They then chose from a two-option choice set consisting of pure virtue and pure vice, allowing us to classify them as people who would otherwise choose pure virtue (initial vice choosers) or pure virtue (initial virtue choosers) in the absence of vice-virtue bundles. Next, they chose from the five-option choice set containing vice-virtue bundles. Finally, they indicated whether they were in favor of the introduction of vice-virtue bundles.

This procedure allowed for the examination of four key outcomes—the tastiness and healthiness perceptions (which we use as a proxy for effectiveness at addressing taste and health goals), the most popular vice-virtue bundle, calories ordered as a result of the introduction of vice-virtue bundles, and favorability toward the introduction of vice-virtue bundles—separately for the three consumer segments outlined in Table 1 (vice lovers: initial vice choosers who believe pure vice tastes better than pure virtue; virtue acceptors: initial virtue choosers who believe pure virtue tastes better than pure virtue; and virtue lovers: initial virtue choosers who do not believe pure vice tastes better than pure virtue).

2.3.1. Method.

Participants and Design. One hundred one participants ($M_{age} = 33.59$, 51.5% female) from Amazon’s Mechanical Turk panel completed this study. This study had a 3 (consumer segment: vice lover, virtue acceptor, virtue lover) × 2 (ratings type: healthiness, tastiness) × 5 (rated option: pure virtue, $\frac{1}{2}$-vice, $\frac{1}{3}$-vice, and pure vice) mixed design, where consumer segment was a between-subjects factor and ratings type and rated option were both within-subjects factors. One participant was excluded because he or she did not fit into any of the three consumer segments.\footnote{One participant was an initial vice chooser who did not rate pure vice as tastier than pure virtue. Including this participant as a vice lover (i.e., with all other initial vice choosers) does not change any of the results.}

Procedure. All participants were shown a choice set with five options: pure virtue, $\frac{1}{2}$-vice, $\frac{1}{3}$-vice, and pure vice. In both this study and Study 4, the pure virtue and vice options were, respectively, a plate of salad and a plate of fries. The vice-virtue bundles included a $\frac{1}{2}$-vice option (a plate of $\frac{1}{2}$ salad and $\frac{1}{2}$ fries), a $\frac{1}{3}$-vice option (a plate of $\frac{1}{2}$ salad and $\frac{1}{3}$ fries), and a $\frac{1}{2}$-vice option (a plate of $\frac{1}{2}$ salad and $\frac{3}{4}$ fries). We selected these stimuli because restaurants frequently offer these side dish choices. See Figure A.1 for the
pictures shown to participants, and see Figure A.2 for the precise food contents (i.e., grams of salad and fries) and calories on each plate.

After viewing the five options, participants rated each option on healthiness (“How healthy do you think this side option is?”) and tastiness (“How tasty do you think this side option is?”), starting with the pure virtue option. Responses were on a scale anchored by 1 = not at all and 7 = very much.

Then, to classify participants as initial vice choosers and initial virtue choosers,12 we showed participants the pure vice and pure virtue options and asked them to imagine getting lunch from their workplace cafeteria and having to select one of the two side options.

Next, participants were told to imagine instead that they now faced the five options, including three vice-virtue bundles.13 They were again asked which side option they would choose. Participants were told that the overall quantity of the side dish was still the same in all options and that they could choose the same or a different side option than they previously chose.

Finally, to examine whether participants want vice-virtue bundles to be introduced, we asked participants, “Which set of side dish offerings would you prefer for your workplace cafeteria to offer?” (from 1 = definitely option A to 7 = definitely option B). Option A referred to the two-option choice set (pure virtue, pure vice), and option B referred to the five-option choice set (pure virtue, ⅓-vice, ⅓-vice, ⅓-vice, pure vice). The midpoint of the scale (4) was labeled not leaning either way.

2.3.2. Results and Discussion. First, we present tastiness and healthiness perceptions aggregated across all participants. Second, we examine tastiness and healthiness perceptions separately for the three consumer segments. Third, we identify the most popular vice-virtue bundle for each consumer segment. Fourth, we examine the impact of introducing vice-virtue bundles on calories ordered for each consumer segment. Finally, we examine whether each consumer segment favors the introduction of vice-virtue bundles.

Aggregated Tastiness and Healthiness Ratings. Past work (Raghunathan et al. 2006) examines participants in aggregate and would suggest inversely related tastiness and healthiness ratings, such that as vice quantity increases, perceived healthiness decreases and perceived tastiness increases. A two-way repeated-measures ANOVA of ratings type (healthiness, tastiness) and rated option (pure virtue, ⅓-vice, ⅓-vice, ⅓-vice, pure vice) on ratings revealed a significant interaction ($F(2,243) = 260.63$, $p < .001$).14

Follow-up tests were then conducted in the form of two separate one-way repeated-measures ANOVAs with rated option predicting healthiness and tastiness. First, a repeated-measures ANOVA predicting healthiness was significant ($F(3, 331) = 501.86$, $p < .001$); follow-up Bonferroni-adjusted contrasts indicated that healthiness ratings consistently followed a “more vice = more unhealthy” rule, such that perceived healthiness decreased significantly with each increase in vice proportion ($p$’s < .001).

Second, a repeated-measures ANOVA on tastiness was also significant ($F(2, 198) = 11.83$, $p < .001$). However, tastiness followed a different pattern: follow-up Bonferroni-adjusted contrasts indicated that the ⅓-vice option was rated as significantly higher in perceived tastiness than the pure virtue option ($p < .001$), the ⅓-vice option was rated as marginally significantly tastier than the ⅓-vice option ($p = .074$), and the ⅓-vice option was rated as similarly tasty as the ⅓-vice option ($p = .359$) and the pure vice option ($p = 1.00$). Together, these ratings15 show that the unhealthy = tasty intuitions that many people hold may weaken within vice-virtue combinations for this set of stimuli, reaching a plateau of ⅓-vice to ⅓-vice (i.e., higher vice proportion equals more unhealthy, but not always more tasty).

Disaggregated Tastiness and Healthiness Ratings. We then examined tastiness and healthiness ratings separately for each consumer segment. First, we verified that three distinct consumer segments exist (Table 1): 43 participants were initial vice choosers who rated pure vice as better tasting than pure virtue (vice lovers), 21 participants were initial virtue choosers who rated pure vice as better tasting than pure virtue (virtue acceptors), and 36 participants were initial

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12 To ensure that the classification of participants as initial vice choosers and initial virtue choosers was not affected by first rating the five options, we compared these participants’ choices from this two-option choice set with the choices made by a separate group of participants who chose from the same two-option choice set without first rating the five options. Using a two-proportion Z-test, we confirmed that the choice shares did not differ depending on whether participants first rated the five options. See the online appendix for additional details.

13 To ensure that participants’ choices among the five options were not affected by first rating the five options and then selecting an option from the two-option choice set, we compared participants’ choices from this five-option choice set with the choices made by a separate group of participants who chose from the same five-option choice set without first rating the five options and selecting from the two-option choice set. Using a Chi-squared test, we confirmed that the choice shares did not differ. See the online appendix for additional details.

14 Mauchley’s test of sphericity was significant for the interaction test ($χ^2(9) = 128.15$, $p < .001$), for the healthiness ratings ($χ^2(9) = 58.08$, $p < .001$), and for the tastiness ratings ($χ^2(9) = 194.18$, $p < .001$). Therefore, the Huynh–Feldt epsilon adjustment was made to the degrees of freedom for all three $F$-tests.

15 In a separate study using a between-subjects design in which participants only rated one of the five options, we found similar aggregated tastiness and healthiness results. See the online appendix for additional details.
virtue choosers who did not rate pure vice as better tasting than pure virtue (virtue lovers). Only one participant was an initial vice chooser who did not rate pure vice as better tasting than pure virtue, supporting our notion that this consumer segment should generally be nonexistent. As noted earlier, we excluded this participant from all analyses.

We first conducted a three-way mixed ANOVA of consumer segment (vice lover, Virtue acceptor, virtue lover), ratings type (healthiness, tastiness), and rated option (pure virtue, 1/2-vice, 1/3-vice, 3/4-vice, pure vice) on ratings. Consumer segment was a between-subjects factor, and ratings type and rated option were both within-subjects factors. This analysis revealed a significant three-way interaction ($F(6, 315) = 19.26$, $p < 0.001$). Follow-up tests were then conducted in the form of three separate two-way repeated-measures ANOVAs, one for each consumer segment, of ratings type (healthiness, tastiness) and rated option (pure virtue, 1/2-vice, 1/3-vice, 3/4-vice, pure vice) on ratings.

For vice lovers, a two-way repeated-measures ANOVA of ratings type (healthiness, tastiness) and rated option (pure virtue, 1/2-vice, 1/3-vice, 3/4-vice, pure vice) on ratings revealed a significant interaction ($F(3,135) = 218.35$, $p < 0.001$) (see Figure 2(a)). Follow-up tests were then conducted in the form of two separate one-way repeated-measures ANOVAs of rated option on healthiness and tastiness. First, a repeated-measures ANOVA on healthiness was significant ($F(3,124) = 192.98$, $p < 0.001$), and follow-up Bonferroni-adjusted contrasts indicated that healthiness ratings consistently followed a “more vice = more unhealthy” rule, such that perceived healthiness decreased significantly with each increase in vice proportion ($p’s < 0.001$). Second, a repeated-measures ANOVA on tastiness was also significant ($F(3,130) = 71.80$, $p < 0.001$). Tastiness did not follow a linear pattern but rather appeared more similar to an increasing concave function: follow-up Bonferroni-adjusted contrasts indicated that the 1/2-vice option was rated as significantly more tasty than the pure virtue option ($p < 0.001$), and the 1/3-vice option was rated as significantly more tasty than the 3/4-vice option ($p < 0.001$); tastiness ratings appeared to plateau at the 1/2-vice option because the 3/4-vice option was rated as equally tasty as the 1/2-vice option ($p = 1.00$). The pure vice option was rated as significantly more tasty than the 1/2-vice and the 3/4-vice options ($p = 0.001$ and $p < 0.001$, respectively), suggesting that a further increase in tastiness occurred from removing all virtue. Altogether, these ratings show consistently that within vice-virtue bundles (consisting of nonzero proportions of both vice and virtue), tastiness plateaus at the 1/2-vice option for these stimuli. The increasing concave tastiness function and the decreasing linear healthiness function are largely consistent with the functional forms of the theoretical tastiness and healthiness functions presented in Figure 1(a). Moreover, the finding that among vice-virtue bundles, tastiness plateaus at the 1/2-vice option for vice lovers suggests that either the 1/3-vice option or the 1/2-vice option, and not the 3/4-vice option, is likely to be the favored vice-virtue bundle among vice lovers.17

Note. Error bars denote standard errors of the mean.

16 Mauchly’s test of sphericity was significant for the three-way interaction test ($\chi^2(9) = 67.79$, $p < 0.001$), for the two-way interaction test for vice lovers ($\chi^2(9) = 33.24$, $p < 0.001$), for the two-way interaction test for virtue acceptors ($\chi^2(9) = 13.92$, $p < 0.001$), for the two-way interaction test for virtue lovers ($\chi^2(9) = 38.66$, $p < 0.001$), for the healthiness ratings for vice lovers ($\chi^2(9) = 43.78$, $p < 0.001$), for the tastiness ratings for vice lovers ($\chi^2(9) = 38.99$, $p < 0.001$), for the healthiness ratings for virtue lovers ($\chi^2(9) = 31.63$, $p < 0.001$), and for the tastiness ratings for virtue lovers ($\chi^2(9) = 40.22$, $p < 0.001$). Therefore, the Huynh–Feldt epsilon adjustment was made to the degrees of freedom for these $F$-tests.

17 As to whether the 1/2-vice option or the 1/3-vice option is likely to be the most popular vice-virtue bundle for vice lovers, we note...
For virtue acceptors, a two-way repeated-measures ANOVA of ratings type (healthiness, tastiness) and rated option (pure virtue, \(\frac{1}{2}\)-vice, \(\frac{1}{2}\)-vice, pure vice) on ratings also revealed a significant interaction \((F(4, 73) = 102.94, p < 0.001)\) (see Figure 2(b)). Follow-up tests were then conducted in the form of two separate one-way repeated-measures ANOVAs of rated option on healthiness and on tastiness. First, a repeated-measures ANOVA on healthiness was significant \((F(4, 80) = 145.14, p < 0.001)\); follow-up Bonferroni-adjusted contrasts indicated that perceived healthiness decreased significantly with each increase in vice proportion (all \(p\)'s < 0.001 except \(p = 0.002\) when shifting from \(\frac{1}{2}\)-vice to \(\frac{1}{2}\)-vice). Second, a repeated-measures ANOVA on tastiness was also significant \((F(4, 80) = 18.13, p < 0.001)\). However, perceived tastiness did not increase linearly but rather in a concave manner: follow-up Bonferroni-adjusted tests indicated that the \(\frac{1}{2}\)-vice option was rated as significantly more tasty than the pure virtue option \((p < 0.001)\), but tastiness ratings appeared to plateau at the \(\frac{1}{2}\)-vice option because the \(\frac{3}{4}\)-vice, \(\frac{1}{2}\)-vice, and pure vice options were all rated as similarly tasty compared to the \(\frac{1}{2}\)-vice option (all three \(p\)'s = 1.00). These ratings show that tastiness plateaus at the \(\frac{1}{2}\)-vice option for these stimuli. The increasing concave tastiness function and the decreasing linear healthiness function are again consistent with the functional forms of the theoretical tastiness and healthiness functions presented in Figure 1(a). Moreover, the finding that among vice-virtue bundles, tastiness plateaus at the \(\frac{1}{2}\)-vice option for virtue acceptors is consistent with our prediction that the \(\frac{1}{4}\)-vice option is likely to be the favored vice-virtue bundle among virtue acceptors.

For virtue lovers, a two-way repeated-measures ANOVA of ratings type (healthiness, tastiness) and rated option (pure virtue, \(\frac{1}{2}\)-vice, \(\frac{1}{2}\)-vice, \(\frac{3}{4}\)-vice, pure vice) on ratings also revealed a significant interaction \((F(3, 102) = 51.98, p < 0.001)\) (see Figure 2(c)). Follow-up tests were then conducted in the form of two separate one-way repeated-measures ANOVAs of rated option on healthiness and on tastiness. First, a repeated-measures ANOVA on healthiness was significant \((F(3, 106) = 171.96, p < 0.001)\), and follow-up Bonferroni-adjusted contrasts indicated that perceived healthiness decreased significantly with each increase in vice proportion (all \(p\)'s < 0.001). Second, a repeated-measures ANOVA on tastiness was also significant \((F(3, 103) = 19.88, p < 0.001)\). Tastiness, like healthiness, was a decreasing function for virtue lovers, making goal balancing irrelevant. Tastiness exhibited a decreasing concave function: follow-up Bonferroni-adjusted contrasts indicated that both the \(\frac{1}{4}\)-vice option and the \(\frac{1}{2}\)-vice option were rated as similarly tasty as the pure virtue option \((p = 1.00\) and \(p = 0.483\), respectively), but tastiness dropped when increasing the vice proportion further, with the \(\frac{3}{4}\)-vice option being rated as less tasty than the \(\frac{1}{2}\)-vice option \((p = 0.006)\) and the pure vice option being rated as less tasty than the \(\frac{3}{4}\)-vice option \((p = 0.026)\). These ratings show that tastiness exhibits a decreasing concave pattern, such that increasing the proportion of vice past \(\frac{1}{2}\) leads to decreases in tastiness. These findings are consistent with our theoretical tastiness and healthiness functions presented in Figure 1(b).

Choice Implications of Offering Vice-Virtue Bundles. When the vice-virtue bundles were added to the choice set, 22.0\% chose pure virtue, 34.0\% chose \(\frac{1}{2}\)-vice, 27.0\% chose \(\frac{1}{2}\)-vice, 4.0\% chose \(\frac{3}{4}\)-vice, and 13.0\% chose pure vice. At the aggregate level, both the \(\frac{1}{4}\)-vice option and the \(\frac{1}{2}\)-vice option were again more frequently selected than the \(\frac{3}{4}\)-vice option \((p < 0.001,\) exact binomial tests).

We then assessed the most popular vice-virtue bundle for each consumer segment (see Table 2). Consistent with the observed forms of the tastiness and healthiness functions, the most popular vice–virtue bundle for vice lovers was the \(\frac{1}{2}\)-vice option (selected by 51.2\% of participants; compared to 9.3\% each for the \(\frac{1}{4}\)-vice and \(\frac{3}{4}\)-vice options, both \(p\)'s = 0.001, exact binomial tests). Additionally, consistent with the observed forms of the tastiness and healthiness functions, the most popular vice-virtue bundle for virtue acceptors was the \(\frac{1}{2}\)-vice option (selected by 71.4\% of participants; compared to 9.5\% for the \(\frac{1}{4}\)-vice option, \(p = 0.002\), and no participants for the \(\frac{3}{4}\)-vice option, \(p < 0.001\), exact binomial tests). Finally, as predicted by variety seeking, the most popular vice-virtue bundle for virtue lovers was the vice-virtue bundle with the smallest proportion of vice: the \(\frac{1}{4}\)-vice option (selected by 41.7\% of participants; compared to 8.3\% for the \(\frac{1}{2}\)-vice option, \(p = 0.008\), and no participants for the \(\frac{3}{4}\)-vice option, \(p < 0.001\), exact binomial tests).

Impact of Introducing Vice-Virtue Bundles on Calories Ordered. In Study 3, we were able to examine, separately for each consumer segment, the change in calories ordered when vice-virtue bundles were introduced. For the analyses in this section, we calculated the calories chosen in each participant’s two choices (see Figure A.2).

First, at the aggregate level in this study, calories ordered was lower after the introduction of vice-virtue bundles (\(M_{\text{before}} = 148\) calories, \(M_{\text{after}} = 132\) calories). A paired-samples t-test was directional, although nonsignificant (t(99) = 1.55, \(p = 0.125\), and a
nonparametric related-samples Wilcoxon signed rank test was significant \( (p = 0.005) \), suggesting overall improvements in calorie profiles with the inclusion of vice-virtue bundles.

Our theory suggests, however, that this difference should be driven by differential changes in calories ordered by consumer segment. Therefore, we examined how introducing vice-virtue bundles impacts calories ordered separately by consumer segment. We first calculated the change in calories ordered for each participant (calories ordered after vice-virtue bundles were introduced minus calories ordered prior to vice-virtue bundles being introduced). A one-way between-subjects ANOVA of consumer segment on change in calories ordered revealed a significant main effect of consumer segment \( (F(2, 97) = 81.48, p < 0.001) \); nonparametric Kruskal–Wallis test: \( p = 0.001 \). Consistent with our theoretical argument, vice lovers ordered on average 109 fewer calories when vice-virtue bundles were introduced, whereas virtue acceptors ordered on average 70 more calories and virtue-lovers ordered on average 45 more calories. The change in calories for vice lovers was significantly different from the change in calories for virtue acceptors and virtue lovers (Bonferroni-adjusted \( p < 0.001 \); Mann–Whitney \( U \)-test \( p < 0.001 \)). Whether the change in calories for virtue acceptors and virtue lovers was significantly different differed depending on whether a Bonferroni-adjusted follow-up test \( (p = 0.478) \) or a Mann–Whitney \( U \)-test was used \( (p = 0.042) \). Most importantly, the upward shift in calories for all initial virtue choosers (virtue acceptors and virtue lovers) was less than the corresponding downward shift in calories for initial vice choosers (vice lovers), suggesting that introducing vice-virtue bundles may have population-level health benefits, even if the population consists of similar proportions of initial vice choosers and initial virtue choosers.

**Choice Set Preference.** Both vice lovers and virtue lovers reported that they would prefer their workplace cafeteria to offer a choice set with vice-virtue bundles (vice lovers: \( M = 5.81, \) significantly \( > 4, t(42) = 5.74, p < 0.001 \); virtue lovers: \( M = 5.28, \) significantly \( > 4, t(35) = 3.60, p < 0.001 \)). Virtue acceptors indicated a directional preference for their workplace cafeteria to offer a choice set with vice-virtue bundles (vice lovers: \( M = 4.90, \) directionally \( > 4, t(20) = 1.55, p = 0.138 \)).

**Discussion.** Study 3 demonstrated that tastiness perceptions of differently composed vice-virtue bundles, relative to each other and to pure virtue or vice options, differ depending on consumer segment. Vice lovers and virtue acceptors both exhibited an increasing concave tastiness function consistent with our predictions in Figure 1(a).\(^{18}\) In contrast, virtue lovers exhibited a decreasing tastiness pattern (consistent with Figure 1(b)) that made goal balancing irrelevant because pure virtue was already able to address both taste and health goals. Unlike the tastiness perceptions, healthiness perceptions did not differ across consumer segments, indicating that these consumer segments differ with respect to taste but not health perceptions, which confirms that we selected vices and virtues that are rather unambiguous in their classification (i.e., we selected clearly unhealthy and healthy options for our vices and virtues).

Consistent with predictions, the most popular vice-virtue bundle for vice lovers was the \( \frac{1}{2} \)-vice option (consistent with asymmetric effectiveness of small vice proportions and relatively higher taste goal importance), and the most popular vice-virtue bundle for both virtue acceptors and virtue lovers was the \( \frac{4}{4} \)-vice option (for virtue acceptors: consistent with asymmetric effectiveness of small vice proportions and relatively higher health goal importance; for virtue lovers, consistent with variety seeking). In general, these findings align with our theoretical framework and expectations about the shapes of the tastiness and healthiness functions for various segments.

These vice-virtue bundle preferences have the important practical implication that the introduction of vice-virtue bundles leads to a smaller increase in calories for initial virtue choosers (virtue acceptors and virtue lovers) who shift from pure virtue to \( \frac{1}{4} \)-vice than the corresponding decrease in calories for initial vice choosers (vice lovers) who shift from pure vice to \( \frac{1}{4} \)-vice.

Finally, Study 3 demonstrated that introducing vice-virtue bundles is looked on relatively favorably by all three consumer segments, suggesting that managers may better meet most consumers’ preferences by altering their firms’ product lines to include vice-virtue bundles.

### 2.4. Study 4: Expanding a Choice Set with Mixed Bundles

In the final study, we had several important objectives. First, Study 4 uses a within-subjects design to

\[^{18}\text{We did find that vice lovers' tastiness function plateaus at a higher proportion of vice (} \frac{1}{2} \text{-vice) than virtue acceptors' tastiness function (} \frac{4}{4} \text{-vice). This finding is consistent with the notion that virtue acceptors may differ from vice lovers in that they perceive pure virtue to have a heightened effectiveness at addressing a taste goal (} F(1, 97) = 11.76, p < 0.001 \), thus leading the tastiness function to plateau at a lower proportion of vice (see Table A.1). Additionally, this finding is not inconsistent with the notion that virtue acceptors may differ from vice lovers in that they place a greater importance on addressing a health goal than a taste goal (see numeric example 2 in Table 1). Importantly, both reasons for differentiating virtue acceptors and vice lovers may be at play for explaining our finding that virtue acceptors prefer to choose a } \frac{1}{2} \text{-vice bundle.} \]
examine the choices that initial vice choosers and initial virtue choosers make when vice-virtue bundles, including and not including the $\frac{1}{2}$-vice option (the preferred option of vice lovers), are offered. We do not separate initial virtue-choosers into those who do and do not believe vice tastes better than virtue (virtue acceptors and virtue lovers, respectively), both because we do not measure tastiness perceptions in Study 4 and because Study 3 found that both consumer segments of initial virtue choosers prefer $\frac{1}{2}$-vice to other vice-virtue bundles.

When the $\frac{1}{2}$-vice option was included, we predicted that we would replicate the results from Study 3 because we were using the same participant pool and food stimuli as in Study 3. Specifically, we predicted that the most popular vice-virtue bundle for initial vice choosers (i.e., vice lovers) would be the $\frac{1}{2}$-vice option, whereas the most popular vice-virtue bundle for initial virtue choosers (i.e., virtue acceptors and virtue lovers) would be the $\frac{1}{2}$-vice option.

When the $\frac{1}{2}$-vice option was not included, we predicted that initial vice choosers would be more likely to choose a $\frac{1}{2}$-vice option than a $\frac{1}{2}$-vice option. The rationale for this hypothesis is that because of the pattern of the tastiness and healthiness functions, a vice-virtue bundle with a smaller proportion of vice would still be substantially effective at addressing taste while still obviously addressing health, whereas a vice-virtue bundle with a larger proportion of vice cannot be substantially effective at addressing health even though it can address taste. Note that although removing the $\frac{1}{2}$-vice option may reduce external validity, this procedure allows a conservative test of our theoretical account for initial vice choosers and tests a hypothesis that a pure variety-seeking account does not predict.

Second, Study 4 examines how the introduction of vice-virtue bundles affects choice share differently from the introduction of vice-virtue bundles, which should be appealing based on the variety offered, but which fail to provide the opportunity to address taste and health goals.

Finally, like Study 3, Study 4 provides an opportunity to examine shifts in calories ordered based on the introduction of vice-virtue bundles, both in aggregate and separately for initial vice choosers and initial virtue choosers.

**2.4.1. Method.**

*Participants and Design.* Three hundred seventy-nine participants ($M_{age} = 33.33$, 56.2% female) from Amazon’s Mechanical Turk panel completed this study. This study had a 2 (choice set type: vice-virtue, vice-virtue) $\times$ 2 (expanded choice set: five options (50/50-option included), four options (50/50-option excluded)) $\times$ 2 (choice version: initial, expanded) mixed-design with choice set type and expanded choice set as between-subjects factors and choice version as a within-subjects factor. Thus, participants were randomly assigned to one of four conditions (vice-virtue five options, vice-virtue four options, vice-virtue four options, or vice-virtue four options), and all participants made two choices: one from a two-item (initial) choice set and one from a four- or five-option (expanded) choice set.

*Procedure.* All participants were asked to imagine getting lunch from their workplace cafeteria and having to select a side option. Participants made two choices. First, they chose between pure versions of the two side options that would later be presented to them in mixed bundles. That is, participants who would see the vice-virtue bundles in the expanded choice set first chose either a plate of salad or a plate of fries. Participants who would later see vice-virtue bundles in the expanded choice set first chose either a plate of macaroni & cheese or a plate of fries. See Figures A.1 and A.2 for pictures, food contents, and caloric content of each plate.

After participants chose one option from their assigned two-option choice set, they were then shown an expanded choice set consisting of either four or five options, depending on their randomly assigned condition. Participants were then told to imagine that they were now faced with this expanded choice set and again asked which side option they would choose. They were told that the overall quantity of the side dish was still the same in all options and that they could choose the same side option as or a different side option than they previously chose. Participants in the five-option (50/50-option included)

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19 Because salad and fries are very different in flavor and people are known to exhibit sensory-specific satiety along the flavor dimension (Inman 2001), we aimed to select a side dish that would be perceived as different in flavor from fries for the other vice in the vice-virtue choice set. In a separate pretest, participants ($N = 39$) saw a plate of macaroni & cheese and a plate of fries and were asked, “How similar or different are the flavors of the foods on these two plates?” Responses were on a scale anchored by 1 = very similar and 7 = very different. Participants indicated that they consider macaroni & cheese to be very different in flavor from fries ($M = 5.77$; significantly different from the scale midpoint of 4, according to a one-sample $t$-test, $t(38) = 8.87, p < 0.001$).

20 Because the potential for demand effects is generally stronger in within-subjects designs than in between-subject designs (Charness et al. 2012), we compared Study 4 participants’ second choice from the vice-virtue four-option choice set and the vice-virtue five-option choice set with a separate group of participants’ first (and only) choice from the vice-virtue four-option choice set and the vice-virtue five-option choice set. Using Chi-squared tests, we confirmed that the choice shares from the vice-virtue four-option choice set and the vice-virtue five-option choice set did not differ between the within-subjects and between-subjects designs. Thus, the second choice that Study 4 participants made does not seem to be driven by demand effects from using a within-subjects design. See the online appendix for additional details.
condition saw the two options they had already seen and three mixed bundles ($\frac{1}{2}$-vice, $\frac{1}{2}$-vice, and $\frac{3}{4}$-vice), and participants in the four-option (50/50-option excluded) condition saw the two options they had already seen and two mixed bundles ($\frac{1}{2}$-vice and $\frac{3}{4}$-vice). The three mixed bundles in the vice-virtue condition were the same as those in Study 3 containing fries and salad. The three mixed bundles in the vice-virtue condition substituted macaroni & cheese for the salad (see Figures A.1 and A.2).

2.4.2. Results and Discussion. We first present the initial choice shares for each of the four conditions. Then we present the main analyses. Specifically, we examine how consumers’ choices change when vice-virtue and vice-vice bundles, including the $\frac{1}{2}$-vice option, are introduced. Second, we examine how consumers’ choices change when mixed vice-vice and vice-vice bundles, dropping the $\frac{1}{2}$-vice option, are introduced. Finally, we examine the impact of introducing vice-virtue bundles (including and dropping the $\frac{1}{2}$-vice option) on calories ordered, separately for initial vice choosers and initial virtue choosers.

Initial Choice Shares. Table 2 shows the initial choice shares across all four conditions. Replicating choice share findings from Study 3 and from the pure vice–pure virtue condition in Studies 1 and 2, the initial choice shares of vice and virtue did not differ in either of the vice-vice conditions ($p = 0.682$ in the vice-vice 50/50-option included condition; $p = 0.121$ in the vice-virtue 50/50-option excluded condition, exact binomial tests). In the vice-vice conditions, the initial choice shares of the two vices differed in the vice-vice 50/50-option included condition ($p = 0.010$, exact binomial test) but not in the vice-vice 50/50-option excluded condition ($p = 1.000$, exact binomial test). Although the initial choice shares of fries and macaroni & cheese were significantly different in the vice-vice 50/50-option included condition, we are still able to examine the relative shifts in choice shares when the vice-vice bundles were introduced.

Introduction of Vice-Virtue and Vice-Vice Bundles, Including the Middle 50/50-Option. When vice-vice bundles were added to the choice set, 17.9% chose pure virtue, 41.1% chose $\frac{1}{2}$-vice, 29.5% chose $\frac{1}{2}$-vice, 5.3% chose $\frac{3}{4}$-vice, and 6.3% chose pure vice. Thus, at the aggregate level, both the $\frac{1}{2}$-vice option and the $\frac{3}{4}$-vice option were more popular than the $\frac{1}{2}$-vice option ($p$’s < 0.001, exact binomial test).

Next we assessed how adding vice-vice bundles shifted participants away from the choice they had made from the pure vice–pure virtue choice set. As shown in Table 2 and replicating Study 3, for initial virtue choosers, the most popular vice-virtue bundle for them to shift to was a $\frac{1}{2}$-vice option (selected by 64.0% of participants; compared to 4.0% for the $\frac{1}{2}$-vice option, $p < 0.001$, and no participants for the $\frac{1}{2}$-vice option, $p < 0.001$, exact binomial tests); for initial vice choosers, the most popular vice-virtue bundle to shift to was a $\frac{1}{2}$-vice option (selected by 57.8% of participants, compared to 15.6% for the $\frac{1}{2}$-vice option, $p = 0.001$, and 11.1% for the $\frac{3}{4}$-vice option, $p < 0.001$, exact binomial tests).

We then examined how adding vice-vice bundles shifted participants away from their initial choice from the pure vice–pure vice set. We hypothesized that introducing vice-vice bundles would not have the same impact on choice as the introduction of vice-virtue bundles. When choosing from expanded vice-vice choice sets, consumers should be guided by variety seeking and their taste preferences rather than by seeking to maximize utility from addressing both health and taste goals. Therefore, we hypothesized that consumers choosing from expanded vice-vice choice sets would not exhibit the same systematic preferences for bundles with relatively small ($\frac{1}{2}$) to medium ($\frac{1}{2}$) proportions of one option as consumers choosing from expanded vice-virtue choice sets, because they would be driven primarily by taste preferences and desire for variety.

As shown in Table 2, movement to vice-vice bundles indeed did not follow the same pattern that characterized movement to vice-virtue bundles. If we consider salad (pure virtue in the vice-virtue set) and macaroni & cheese (vice A in the vice-vice set) to be comparable options within their respective choice sets, then whereas the most popular option for initial virtue choosers was a $\frac{1}{2}$-vice option (chosen by 64.0% of initial virtue choosers), vice A choosers were equally likely to shift to $\frac{1}{2}$-vice B as to shift to $\frac{1}{2}$-vice B (31.1% chose $\frac{1}{2}$-vice B and 44.3% chose $\frac{1}{2}$-vice B; $p = 0.302$, exact binomial test). In addition, whereas the most popular option for initial vice choosers in the vice-virtue condition was a $\frac{1}{2}$-vice option (chosen by 57.8% of initial vice choosers), initial vice B choosers were equally likely to shift to $\frac{1}{2}$-vice B as to to $\frac{1}{2}$-vice B (37.1% chose $\frac{3}{4}$-vice B and 28.6% chose $\frac{1}{2}$-vice B; $p = 0.678$, exact binomial test).

Introduction of Vice-Virtue and Vice-Vice Bundles, Excluding the Middle 50/50-Option. We next examined the impact of introducing mixed bundles without the $\frac{1}{2}$-vice bundle option. First, we examined the impact of removing the $\frac{1}{2}$-vice option on initial virtue choosers and initial vice choosers. The removal of the $\frac{1}{2}$-vice option should not impact initial virtue choosers; very few initial virtue choosers (only 4.0%) selected that option when it was offered because they preferred the $\frac{1}{2}$-vice option. Thus, we predicted that initial virtue choosers would continue to choose the $\frac{1}{2}$-vice option over the $\frac{1}{2}$-vice option when the $\frac{1}{2}$-vice option was removed. In contrast, the removal of the $\frac{1}{2}$-vice option should impact
initial vice choosers, because many (57.8%) selected that option when it was offered. Importantly, given our theory about the forms of the tastiness and healthiness functions, we predicted that initial vice choosers would gravitate towards the ¼-vice option over the ½-vice option because taste and health goals can be more successfully addressed through a relatively large shift toward health.

As expected, initial virtue choosers continued to choose the ¼-vice option over the ½-vice option when the ¼-vice option was excluded (58.2% chose the ¼-vice option and no participants chose the ½-vice option; \(p < 0.001\), exact binomial test). Recall that when the ¼-vice option was included in the expanded choice set, 64.0% chose the ¼-vice option and no participants chose the ½-vice option. Essentially, removing the ¼-vice option has no impact on initial virtue choosers. Moreover, of particular interest, initial vice choosers were more likely to shift to the ¼-vice option than to the ½-vice option (48.7% chose the ½-vice option whereas 20.5% chose the ¼-vice option; \(p = 0.052\), exact binomial test). Recall that when the ½-vice option was included, 15.6% chose the ½-vice option and 11.1% chose the ¼-vice option. That is, a large percentage (48.7%) of initial vice choosers exhibited preference shifts, moving from a pure vice option to one with less than ¼-vice, providing strong support for the notion that variety seeking alone cannot account for our findings for initial vice choosers.

Second, we examined the impact of removing the 50/50 middle option on pure vice A and pure vice B choosers. The removal of the 50/50 middle option should impact both pure vice A and pure vice B choosers because the 50/50 middle option was chosen by approximately one-third of participants (31.1% of pure vice A choosers and 28.6% of pure vice B choosers) when it was offered. However, given that vice-vice bundles do not offer the unique property of addressing both taste and health, we do not expect to see patterns of preference shifts (i.e., situations in which someone who would have selected a given pure option in fact selects an option that is less than half of that option when given the option of a bundle) in the presence of vice-vice bundles. Such a lack of preference shifts would further support our theory because among vice-vice bundles, tastes and variety seeking alone are driving preferences. Therefore, an initial choice of vice A should indicate a taste preference for vice A, such that initial vice A choosers should rarely switch to an option consisting of less than half of vice A.

As expected, initial vice A choosers were indeed more likely to choose the ¼-vice B option than the ½-vice B option (68.1% chose ¼-vice B whereas 8.5% chose ½-vice B; \(p < 0.001\), exact binomial test), and initial vice B choosers were directionally, although nonsignificantly, more likely to choose the ½-vice B option than the ¼-vice B option (34.0% chose ½-vice B whereas 19.1% chose ¼-vice B; \(p = 0.230\), exact binomial test). Thus, preference shifts happen more frequently among initial vice choosers who are offered vice-virtue bundles than among initial vice choosers who are offered vice-vice bundles.

**Impact of Introducing Mixed Bundles on Calories Ordered in the Vice-Virtue Conditions.** We then calculated the calories in each participant’s two chosen options (see Figure A.2).

First, we examined how introducing vice-virtue bundles impacts changes in calories ordered at the aggregate level. In keeping with our overall study design, we conducted a 2 (expanded choice set: 50/50-option included, 50/50-option excluded) × 2 (choice version: initial, expanded) mixed model ANOVA on calories ordered with expanded choice set as a between-subjects factor and choice version as a within-subjects factor and found a significant main effect of choice version \((F(1, 187) = 15.64, p < 0.001)\) but no significant interaction \((F(1, 187) = 0.39, p = 0.533)\). This result suggests that the change in calories ordered did not differ depending on whether the 50/50-option was included in the choice set or not. However, calories ordered was significantly lower after the introduction of vice-virtue bundles \((M_{before} = 152 \text{ calories}, M_{after} = 119 \text{ calories}; \text{paired-samples} t\text{-test: } t(188) = 3.96, p < 0.001); nonparametric related-samples Wilcoxon signed rank test: \(p < 0.001)\), suggesting overall improvements in calorie profiles with the inclusion of vice-virtue bundles (with or without the ¼-vice middle option).

Second, and more important for our theoretical account, we examined how introducing vice-virtue bundles impacts calories ordered differently for initial virtue choosers versus initial vice choosers. We first calculated the change in calories ordered for each participant (calories ordered after vice-virtue bundles were introduced minus calories ordered prior to vice-virtue bundles being introduced). A 2 (expanded choice set: 50/50-option included, 50/50-option excluded) × 2 (initial choice: pure virtue, pure vice) between-subjects ANOVA on change in calories ordered revealed a significant main effect of initial choice \((F(1, 185) = 360.30, p < 0.001)\) and no significant interaction \((F(1, 185) = 1.35, p = 0.247)\). Consistent with Study 3, initial virtue choosers ordered

---

21 Because Levene’s test of homogeneity of variances was violated for the change in calories ordered \((p < 0.001)\), and we are not aware of a robust alternative procedure for a two-way ANOVA, we reran the two-way ANOVA as a one-way ANOVA with four groups. We used the Brown–Forsythe procedure for the one-way ANOVA and then conducted follow-up contrasts using the Games–Howell procedure and came to the same conclusions.
on average 50 more calories when vice-virtue bundles were introduced, whereas initial vice choosers ordered on average 136 fewer calories. The lack of a significant interaction indicates that this effect was similar regardless of whether the second choice set included four or five options. Again, the upward shift in calories for initial virtue choosers was less than the corresponding downward shift in calories for initial vice choosers.

Discussion. Study 4 replicates the finding that people tend to select vice-virtue bundles with \( \frac{1}{2} \)-vice or \( \frac{1}{2} \)-vice. As in Study 3, initial virtue choosers frequently switched to a \( \frac{1}{2} \)-vice option, consistent with a combination of asymmetric effectiveness of small vice proportions (virtue acceptors) and variety seeking (virtue lovers) at play, and initial vice choosers (vice lovers) frequently switched to a \( \frac{1}{2} \)-vice option, consistent with asymmetric effectiveness of small vice proportions.

To further test our account for initial vice choosers, Study 4 also tested the impact of excluding the \( \frac{1}{2} \)-vice option from the expanded choice set. Supporting our theorizing, in the absence of the \( \frac{1}{2} \)-vice option, initial vice choosers were more likely to choose the \( \frac{1}{2} \)-vice option than the \( \frac{1}{2} \)-vice option.

Finally, on a practical level, Study 4 replicated the finding from Study 3 that introducing vice-virtue bundles can decrease calories ordered, especially if a large proportion of consumers otherwise chooses pure vice. This finding is important because most patrons at many restaurants, including fast food restaurants, tend to choose pure vice in the absence of vice-virtue bundles (Wilcox et al. 2009).

3. General Discussion

Although a substantial amount of research has attempted to propose ways to shift consumers’ choices from vice to virtue options, there are reasons to believe such efforts may be unsuccessful. In the present research, we propose that introducing vice-virtue bundles may offer some means of nudging at least some consumers toward healthier consumption. Specifically, across four studies, we find that people consistently prefer vice-virtue bundles with small \( \frac{1}{4} \) to medium \( \frac{1}{2} \) proportions of vice to vice-virtue bundles with large \( \frac{3}{4} \) proportions of vice. We suggest that these choice patterns arise due to (1) asymmetric effectiveness of small vice and virtue proportions at addressing taste and health goals, respectively, by those who perceive pure vice as tastier than pure virtue (vice lovers and virtue acceptors) and (2) variety seeking by those who do not perceive pure vice as tastier than pure virtue (vice lovers and virtue acceptors). We find taste and healthiness ratings as well as choice patterns that are consistent with this theoretical account of two different mechanisms at play for three different consumer segments. See Table 3 for a summary of key findings across studies.

It would not be accurate to conclude that aggregate caloric consumption will necessarily be decreased by the introduction of vice-virtue bundles. Rather, our framework predicts differential effects on caloric consumption depending on consumers’ a priori choice of virtue or vice. Indeed, both Studies 3 and 4 demonstrate that the aggregate impact of introducing vice-virtue bundles is likely to be a decrease in calories ordered when the proportion of initial vice choosers (also known as vice lovers) in the population is high—a condition that may be predictable based on observable characteristics, such as dining context or prior sales data.

3.1. Relationship and Contribution to Prior Research

From a theoretical perspective, research on balancing taste and health goals tends to focus on either the choice of food (Dhar and Simonson 1999, Wilcox et al. 2009) or the quantity of consumption (Haws and Winterich 2013, Redden and Haws 2013, Schwartz et al. 2012). In contrast, in the present research, we examine both choice and quantity by focusing on single-decision contexts that incorporate choices about the relative quantities of vice and virtue within food decision-making contexts. This approach allows us to propose and test for unique tastiness and healthiness functional forms, which we argue underlie consumers’ preferred proportions of vice and virtue.

This approach is important because prior research on goal balancing is typically agnostic as to consumers’ preferred proportions of vice and virtue (Dhar and Simonson 1999, Fishbach and Dhar 2005, Fishbach and Zhang 2008, Laran 2010). Furthermore, work in licensing (Khan and Dhar 2006) tends to suggest that consumers alternate between virtue and vice choices over time. Our findings contribute to both of these literatures. We contribute to the literature on goal balancing by suggesting that a small proportion of virtue \( \left( \frac{1}{4} \right) \) is considerably effective at addressing a taste goal, whereas a small proportion of virtue \( \left( \frac{1}{4} \right) \) is not considerably effective at addressing a health goal. It may be that including a small proportion of vice in a food option provides a small but powerful positive utility. This possibility would be consistent with the notion of a silver-lining effect that takes advantage of the steep part of the gain function associated with prospect theory (Kahneman and Tversky 1979).

Indeed, consumers’ perceptions of the healthiness and tastiness of vice-virtue bundles may make it relatively easy to restrict vice quantity because bundles with relatively small proportions of vice are perceived as healthier without being less tasty than vice-virtue bundles with larger proportions of vice. This notion is of particular theoretical and practical interest because
it builds on research on the unhealthy = tasty intuition (Raghunathan et al. 2006) and extends understanding of this intuition to evaluations of multiple food combinations varying in relative quantities of each food. We show that the unhealthy = tasty pattern occurs for most consumers mainly when they consider the anchors (pure virtue and pure vice) and that examining vice-virtue bundles reveals an asymptote, such that marginal increases in vice proportion produce little impact on perceived tastiness. This finding demonstrates an important boundary condition for the unhealthy = tasty intuition and suggests ways to promote healthier food choices that are also perceived as tasty (Glanz et al. 1998). Moreover, although we chose to focus on logical proportions of vices and virtues in our four studies, determining how far the boundaries could be pushed (e.g., would as low as 10% vice still be appealing?) and still maintain the present effects on choice could be examined in future research. Additionally, we focused on choice of relative quantities of vice and virtue in contexts with predetermined choice sets. Future research could examine the relative quantities of vice and virtue chosen in a context in which unlimited quantities of each were available, such as at a buffet.

We also provide some insights into “licensing” effects, whereby consumers use previous virtuous acts to justify subsequent indulgence (Khan and Dhar 2006). Such effects are often highlighted as a part of the goal-balancing process. In a sense, our results might speak to “simultaneous licensing” because consumers may view the virtue within a vice-virtue bundle as licensing consumption of the vice, in that it allows consumers to rationalize their indulgent consumption (Bublitz et al. 2010). However, in addition to differences in sequential versus simultaneous decision making, we also deviate from licensing literature by finding that a small amount of virtue may not compensate for a larger amount of vice.

Finally, it is uncommon in consumer behavior research to mix experimental interventions with customer segmentation. Yet this paper demonstrates that doing so has important theoretical and empirical implications; it enriches our understanding of perceptions, choice, and caloric consequences of vice-virtue bundles. Thus, future consumer behavior work may also want to consider using this approach because it may sometimes have both theoretical and practical benefits.

3.2. Generalization to Nonfood Domains

We focus on understanding vice-virtue bundles in the food domain for three main reasons. First, many consumers seek, yet often struggle, to address both

<table>
<thead>
<tr>
<th>Study</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>People were more likely to choose vice-virtue bundles with relatively small (1/2) or medium (1/3) vice proportions than vice-virtue bundles with relatively large (1/4) vice proportions when making actual choices.</td>
</tr>
</tbody>
</table>
| 2     | People were more likely to choose vice-virtue bundles with relatively small (1/2) or medium (1/3) vice proportions than vice-virtue bundles with relatively large (1/4) vice proportions when making actual choices.  
  The majority of participants consumed the entire option they selected, indicating that offering vice-virtue bundles does not increase food waste.  
  Offering vice-virtue bundles decreases subsequent post-study caloric intake. |
| 3     | Vice lovers (initial vice choosers) exhibited tastiness and healthiness functions largely consistent in form with our predictions in Figure 1(a).  
  Initial increases in the proportion of vice led to significant increases in perceived tastiness, with tastiness plateauing at the 1/2-vice option within the bundles.  
  In contrast, increases in the proportion of vice led to significant decreases in perceived healthiness and did not plateau.  
  Consistent with these functions and with numeric example 1 in Table 1, when vice-virtue bundles were added to the choice set, the most popular vice-virtue bundle was the 1/2-vice option.  
  Virtue acceptors (initial virtue choosers who believe pure virtue tastes better than pure virtue) also exhibited tastiness and healthiness functions consistent in form with our predictions in Figure 1(a).  
  An initial increase in the proportion of vice led to a significant increase in perceived tastiness, with tastiness plateauing at the 1/4-vice option within the bundles.  
  In contrast, increases in the proportion of vice led to significant decreases in perceived healthiness and did not plateau.  
  Consistent with these functions and with numeric example 2 in Table 1, when vice-virtue bundles were included in the choice set, the most popular vice-virtue bundle was the 1/4-vice option.  
  Initial increases in the proportion of vice led to significant increases in perceived tastiness, with tastiness plateauing at the 1/4-vice option within the bundles.  
  In contrast, increases in the proportion of vice led to significant decreases in perceived healthiness and did not plateau.  
  Consistent with these functions and with numeric example 2 in Table 1, when vice-virtue bundles were included in the choice set, the most popular vice-virtue bundle was the 1/4-vice option, consistent with variety seeking.  
  Introduction of vice-virtue bundles decreased aggregate calories ordered, via decreases in calories ordered among vice lovers.  
  Vice lovers and virtue lovers indicated a significant preference for vice-virtue bundles to be offered, and vice acceptors indicated a directional preference for vice-virtue bundles to be offered. |
| 4     | Initial virtue choosers (virtue acceptors and virtue lovers) frequently switched to vice-virtue bundles with a relatively small (1/4) vice proportion, and initial vice choosers (vice lovers) frequently switched to a vice-virtue bundle with a medium (1/3) vice proportion.  
  Further in support of the notion that the choice patterns that we predicted for initial vice choosers (vice lovers) cannot be explained by pure variety seeking, we found that in the absence of the middle bundle (1/4-vice), initial vice choosers (vice lovers) were more likely to choose an option with a relatively small (1/4) vice proportion than one with a relatively large (1/2) vice proportion.  
  Movement to vice-virtue bundles did not follow the same pattern that characterized movement to vice-virtue bundles.  
  Offering vice-virtue bundles decreases aggregate calories ordered, via decreases in calories ordered among vice lovers. |


taste and health goals (Dhar and Simonson 1999, Glanz et al. 1998, Stewart et al. 2006). Second, limiting consumption quantity of unhealthy foods (vices) is of concern to many stakeholders, including consumers, researchers, policy makers, and managers (Chandon and Wansink 2014). Finally, many in the food industry are actively seeking new, healthier options that consumers will voluntarily choose (Sifferlin 2013, Strom 2013, Wansink 2012)—vice-virtue bundles may be such an option.

Given this focus on the food domain, the findings in our research may be specific to the characteristics of health and taste goals and to the functions presented in Figures 1(a) and 1(b). However, future research should explore contexts with similar trade-offs between affective and cognitive attributes, as the concepts of identifying functional shapes for affective and cognitive attributes and of identifying utility-maximizing bundle options are quite valid in domains beyond that of food decision making. We do note that research has shown that people do not always want to address both competing affective and cognitive attributes when it comes to their choices in a single consumption episode (Dhar and Simonson 1999). For instance, whereas people often aim for balancing (i.e., addressing both) taste (affective attribute) and health (cognitive attribute), they may instead aim for highlighting either taste (affective attribute) or cost (cognitive attribute) (Dhar and Simonson 1999). When highlighting is preferred, the utility function for consumers may include an additional negative utility term for all bundle options, such that pure options provide greater utility than bundle options.

3.3. Practical Implications for Consumers and Managers

For consumers, there are important implications of shifting from pure vice options to vice-virtue bundles. First, the calorie savings can be clinically significant if such choice shifts persist over repeated decisions. Take, for instance, the example of an average overweight adult consumer shifting from a medium fries at McDonald’s (380 calories) (McDonald’s 2013b) to a McDonald’s fries–salad bundle with half fries (190 calories) and half side salad (10 calories). If this consumer visited McDonald’s once per week and made this choice shift every time for a year, she would eventually lose two to three pounds, with half that amount lost in one year and 95% of that amount lost in approximately three years, according to a dynamic simulation model of weight change (Hall et al. 2011). To put this into context, the average adult in the United States gains about one to two pounds per year (Jeffery and French 1999), a gain that can translate into significant health consequences (Hubert et al. 1983, Williamson et al. 1991).

There are also implications for consumers shifting from pure virtue options to vice-virtue bundles. Our data show that introducing vice-virtue bundles leads some consumers who would otherwise choose pure virtue to shift to a vice-virtue bundle with a small proportion of vice. That the introduction of vice-virtue bundles may lead to higher caloric intake for some consumers raises the important question of when introducing vice-virtue bundles is responsible from a consumer welfare perspective. We suggest that vice-virtue bundles should only be introduced when the population contains a large enough percentage of initial vice choosers that there is still an aggregate savings in calories. We note that because a typical shift for initial virtue choosers (i.e., from pure virtue to \(\frac{1}{2}\)-vice) is approximately half the size of a typical shift for initial vice choosers (i.e., from pure vice to \(\frac{1}{2}\)-vice), substantial calorie savings would still occur at the population level if there were equal percentages of initial virtue choosers and initial vice choosers in the population. In addition, Study 2 demonstrates that offering vice-virtue bundles appears to decrease subsequent caloric intake, suggesting that offering vice-virtue bundles may actually have positive consequences for subsequent caloric consumption. Future research may examine whether offering vice-virtue bundles with a small amount of vice may satisfy some consumers’ vice food cravings. Indeed, research has shown that depriving restrained eaters (who experience stronger food cravings) of vice foods can lead them to subsequently overeat these strongly desired foods (Polivy et al. 2005). Therefore, offering fixed vice-virtue bundles with small proportions of vice may allow these eaters to satisfy their cravings for vice foods and stem subsequent overeating. Finally, although it does not mitigate the potential increase in caloric intake for initial virtue choosers, Study 3 does indicate that most consumers are in favor of introducing vice-virtue bundles.

This research also has important implications for managers, who are under increasing pressure to promote healthier selections. In a recent commentary, Wansink (2012) highlighted the history of the food industry’s response to the obesity epidemic, starting with denial of its role in obesity, shifting to appeals to consumer sovereignty via calls for moderation and increasing access to healthy choices, and finally shifting to development of “profitable win–win solutions to help consumers better control what and how much they eat” (p. 54). Vice-virtue bundles may fall squarely in this third category of profitable win–win solutions that many companies are now focusing on. Given that consumers consistently find vice-virtue bundles to be attractive, managers should consider adding vice-virtue bundles to their product lines. For restaurants and food vendors that already offer...
pure vice and virtue options, vice-virtue bundles provide an opportunity for product line expansion through existing items rather than through development of completely new offerings. This opportunity may provide cost savings because many food establishments devote considerable resources to developing new product offerings (Sifferlin, 2013, Strom, 2013), which in turn can increase inventory or production costs.

In addition, if vice-virtue bundles are added to menu offerings, managers can consider whether to charge a price premium for them. In our studies, price is implicitly held constant across options to avoid activating any inferences that consumers might draw from different prices (Hamilton and Koukova, 2008, Harris and Blair, 2006) and to avoid consumers choosing based on budget or monetary concerns. In this no-price-premium world, we found that most people favored the introduction of vice-virtue bundles. Thus, offering vice-virtue bundles potentially translates into more favorable attitudes toward the brand, increased long-term customer loyalty, and increased frequency of revisiting the firm (Wansink, 2012). Of course, some managers might decide to charge a price premium for vice-virtue bundles. In this case, introducing vice-virtue bundles may allow managers to extract consumer surplus via higher prices.

To conclude, our research presents a first look at a novel choice offering—vice-virtue bundles—and examines its psychological underpinnings. To examine these psychological underpinnings, we did not use marketing messages, nor did we deviate from choice sets featuring two, four, or five options. However, in the real world, marketing messages could be added to explicitly promote preference for certain vice-virtue bundles (“You can get your cake and eat it too—especially if you have mostly fruit salad!”). Managers could also experiment with offering smaller choice sets while still promoting health and taste via vice-virtue bundles. For instance, a simple choice set might contain only three options (e.g., pure virtue, pure vice, and 1/4-vice) or an even simpler choice set might contain only two options (e.g., 1/4-vice and 3/4-vice). Such smaller choice sets may be especially attractive to fast food restaurants, for which speed and convenience, and hence a limited menu, are highly important for operations. With the right marketing and the right choice sets, we believe that vice-virtue bundles offer exciting directions for future research and practice aimed at maximizing health without compromising taste.

**Supplemental Material**

Supplemental material to this paper is available at http://dx.doi.org/10.1287/mnsc.2014.2053.

**Acknowledgments**

The authors gratefully acknowledge Jim Bettman, Joel Huber, Rick Larrick, and Jack Soll for helpful comments on a prior draft of this paper. The authors also thank Mary Bohall, Keri Dickens, Nicole Lee, Shannon Lin, Diana Mao, Alex Simko, Aline Swiec, Hayley Trainer, Thomas Vosburgh, Wandi Wang, and the Fuqua Behavioral Lab for research assistance. Finally, the authors are grateful to the Fuqua School of Business at Duke University for funding this research.

**Appendix**

Table A.1 Constructed Numeric Example for Weighted Sum Model of Choice Among Vice-Virtue Bundles for Virtue Acceptors If They Differed from Vice Lovers Because of Heightened Effectiveness of Virtue at Meeting Taste Goal (Rather Than Heightened Importance of Health Goal over Taste Goal)

<table>
<thead>
<tr>
<th>Segment 2: Virtue acceptors</th>
<th>Effectiveness at addressing taste goal (a)</th>
<th>Taste goal importance weight (b)</th>
<th>Effectiveness at addressing health goal (c)</th>
<th>Health goal importance weight (d)</th>
<th>Total utility of each option ((a \times b) + (c \times d))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure virtue 10</td>
<td>0.55</td>
<td>40</td>
<td>0.45</td>
<td>23.50</td>
<td></td>
</tr>
<tr>
<td>Select pure virtue in the absence of vice-virtue bundles, based on viewing pure virtue as slightly addressing a taste goal.</td>
<td>33</td>
<td>0.55</td>
<td>30</td>
<td>0.45</td>
<td>31.65</td>
</tr>
<tr>
<td>1/4-vice 38</td>
<td>0.55</td>
<td>20</td>
<td>0.45</td>
<td>29.90</td>
<td></td>
</tr>
<tr>
<td>1/2-vice 40</td>
<td>0.55</td>
<td>10</td>
<td>0.45</td>
<td>26.50</td>
<td></td>
</tr>
<tr>
<td>Pure vice 40</td>
<td>0.55</td>
<td>0</td>
<td>0.45</td>
<td>22.00</td>
<td></td>
</tr>
</tbody>
</table>

Notes. To interpret this table, the notes for Table 1 also apply. This table presents an alternative constructed numeric example for virtue acceptors if virtue acceptors were to differ from vice lovers because they believe that pure virtue could be somewhat effective at meeting a taste goal rather than because they prioritize a health goal over a taste goal (as was the case in numeric example 2 in Table 1). In this example in this table, we assume that a virtue acceptor places greater importance on addressing a taste goal than a health goal, like a vice lover (see numeric example 1 in Table 1). However, rather than use the same tastiness function as in the vice lover example, we assume that the tastiness function for virtue acceptors is shifted relative to that of vice lovers—virtue acceptors feel that a pure virtue can meet a taste goal better than do vice lovers. As this table shows, the more effectively an individual believes that a virtue can meet a taste goal, the greater the preference for an option with a somewhat lower vice proportion. Indeed, like numeric example 2 in Table 1, this example in the appendix leads to the same prediction that virtue acceptors are likely to prefer a vice-virtue bundle with a lower proportion of vice than vice lovers prefer (e.g., a 1/4-vice option rather than a 1/2-vice option). Thus, either reason for differentiating virtue acceptors from vice lovers (differences in goal importance or differences in perceived effectiveness of pure virtue at addressing a taste goal) can lead to the same choice prediction for virtue acceptors, and in reality, both reasons may operate.
### Figure A.1 (Color online) Study Stimuli

<table>
<thead>
<tr>
<th>Menu</th>
<th>Study</th>
<th>Pure virtue or vice A</th>
<th>(\frac{1}{2})-vice B</th>
<th>(\frac{1}{2})-vice B</th>
<th>(\frac{3}{4})-vice B</th>
<th>(\frac{3}{4})-vice B</th>
<th>Pure virtue or vice B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vice-virtue</td>
<td>1</td>
<td>Baby carrots and potato chips</td>
<td>Calories: 33; Contents: 12 baby carrots (91 g.)</td>
<td>Calories: 68; Contents: 9 baby carrots (63 g.), potato chips (8 g.)</td>
<td>Calories: 96; Contents: 6 baby carrots (45 g.), potato chips (14 g.)</td>
<td>Calories: 130; Contents: 3 baby carrots (27 g.), potato chips (21 g.)</td>
<td>Calories: 160; Contents: potato chips (28 g.)</td>
</tr>
<tr>
<td>Apple slices and Oreo cookies</td>
<td>2</td>
<td>Calories: 36; Contents: 4 apple slices (69 g.)</td>
<td>Calories: 80; Contents: 3 apple slices (52 g.), 1 Oreo cookie (11 g.)</td>
<td>Calories: 125; Contents: 2 apple slices (35 g.), 2 Oreo cookies (23 g.)</td>
<td>Calories: 169; Contents: 1 apple slice (17 g.), 3 Oreo cookies (34 g.)</td>
<td>Calories: 213; Contents: 4 Oreo cookies (45 g.)</td>
<td></td>
</tr>
<tr>
<td>Salad and fries</td>
<td>3 and 4</td>
<td>Calories: 14; Contents: lettuce mix (30 g.), 4 tomato slices (38 g.)</td>
<td>Calories: 91; Contents: lettuce mix (22 g.), 3 tomato slices (25 g.), fries (25 g.)</td>
<td>Calories: 169; Contents: lettuce mix (15 g.), 2 tomato slices (18 g.), fries (50 g.)</td>
<td>Calories: 247; Contents: lettuce mix (8 g.), 1 tomato slice (10 g.), fries (75 g.)</td>
<td>Calories: 325; Contents: fries (100 g.)</td>
<td></td>
</tr>
<tr>
<td>Vice-vice</td>
<td>4</td>
<td>Macaroni &amp; cheese and fries</td>
<td>Calories: 400; Contents: macaroni &amp; cheese (250 g.)</td>
<td>Calories: 377; Contents: macaroni &amp; cheese (187 g.), fries (24 g.)</td>
<td>Calories: 359; Contents: macaroni &amp; cheese (125 g.), fries (49 g.)</td>
<td>Calories: 346; Contents: macaroni &amp; cheese (62 g.), fries (76 g.)</td>
<td>Calories: 325; Contents: fries (100 g.)</td>
</tr>
</tbody>
</table>

**Note.** For all sets of stimuli other than the apple slices and Oreo cookies stimuli set, the calories in this figure were calculated based on the actual grams of each food depicted in the photographs in Figure A.1. For the apple slices and Oreo cookies, the calories in this figure were calculated based on the following approximations: one apple slice weighs approximately 17.31 grams and has 9 calories (http://www.fatsecret.com); one Oreo cookie weighs approximately 11.33 grams and has 53.33 calories (http://caloriecount.about.com).

### Figure A.2 Calories and Contents of Study Stimuli

<table>
<thead>
<tr>
<th>Menu</th>
<th>Study</th>
<th>Pure virtue or vice A</th>
<th>(\frac{1}{2})-vice B</th>
<th>(\frac{1}{2})-vice B</th>
<th>(\frac{3}{4})-vice B</th>
<th>(\frac{3}{4})-vice B</th>
<th>Pure virtue or vice B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vice-virtue</td>
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</tr>
<tr>
<td>Macaroni &amp; cheese and fries</td>
<td>4</td>
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</tr>
</tbody>
</table>

**Notes.** For all sets of stimuli other than the apple slices and Oreo cookies stimuli set, the calories in this figure were calculated based on the actual grams of each food depicted in the photographs in Figure A.1. For the apple slices and Oreo cookies, the calories in this figure were calculated based on the following approximations: one apple slice weighs approximately 17.31 grams and has 9 calories (http://www.fatsecret.com); one Oreo cookie weighs approximately 11.33 grams and has 53.33 calories (http://caloriecount.about.com).

### References


Eat, Drink, and Be Merry? Decreasing Conflict Between Healthy Eating and Affiliation

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Version: June 2, 2015

Draft manuscript - Please do not cite or circulate without authors’ permission.

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**Contribution Statement:** The present research extends beyond the typical conflict between a health goal and taste goal that has been studied in the food domain (1) to demonstrate that a health goal conflicts with the social goal of affiliating with (or relatedly, being liked by) an indulging dining companion (a dining companion who chooses to consume unhealthy food) and (2) to offer two strategies for decreasing this conflict. First, this research contributes to the eating behavior literature by providing a more comprehensive picture of sources of conflict with healthy eating; that is, conflicts arise not only from characteristics of food, but also from the social context in which food choice occurs. Second, whereas prior research has shown that having a goal to affiliate leads consumers to behave more similarly to—and to express similar consumption preferences as—those they want to affiliate with (Lakin and Chartrand 2003; Mead et al. 2011), we show that not all dimensions are created equal when it comes to affiliation; specifically, a goal to affiliate leads consumers to prioritize similarity on healthiness over flavor. Finally, prior research indicates that similarity in behaviors promotes affiliation more than dissimilarity (Chartrand and Bargh 1999; Hove and Risen 2009) and that matching an indulging consumer on healthiness should lead to greater affiliation than mismatching (Leone, Herman, and Pliner 2008; Lowe and Haws 2014). We identify two strategies that, when used, can lead mismatching an indulging consumer on healthiness to lead to as much or greater affiliation than matching on healthiness.

**Abstract:** Whereas much past research has focused on the conflict between a health goal and a taste goal, we focus on the conflict between a health goal and a social goal. Specifically, we examined how choosing a healthier food can conflict with affiliation with a dining companion who has chosen a less healthy food and how this conflict can be decreased so that choosing healthier food does not conflict with affiliation. In eight studies, we consider dyads of consumers making sequential ordering choices, wherein the first consumer to order (“the indulging consumer”) chooses an unhealthy option and the second consumer to order (“the responding consumer”) faces a choice between an unhealthy option and a healthy option. The first set of studies (Studies 1-3) show that an affiliation goal often leads the responding consumer to choose an unhealthy option, thereby matching the indulging consumer on healthiness. The second set of studies show that choosing an unhealthy option indeed leads to greater affiliation with the indulging consumer (Study 4). Importantly, however, responding consumers can use strategies to decrease this conflict: they can offer to share a healthy choice for variety’s sake (Study 5) or attribute a healthy choice to a health issue (Study 6) and be liked as much as if they had made an unhealthy choice.
Although many people report wanting to engage in healthier eating (International Food Information Council Foundation 2012), many fail to follow this goal consistently (Ogden et al. 2014). The widespread failure to follow healthy eating goals suggests that numerous barriers hinder healthy eating. One barrier may be the goal to have an enjoyable eating experience. Yet existing research on goals conflicting with healthy eating has focused extensively and nearly exclusively on the tastiness goal—the desire for enjoyment from the taste of food (Dhar and Simonson 1999; Etkin, Evangelidis, and Aaker 2015; Fishbach, Friedman, and Kruglanski 2003; Laran 2010; Liu et al. 2015; Raghunathan, Naylor, and Hoyer 2006; Shiv and Fedorikhin 1999; Stroebe et al. 2013). Although people certainly derive enjoyment from the taste of food, it is not the only source of enjoyment in the eating experience. In fact, another source of enjoyment from the eating experience comes from having a positive interaction with one’s dining companion(s). Given how frequently people order and consume foods in social settings alongside others, it is surprising that little research has examined people’s social goals (e.g., the goal to affiliate with or relatedly, to be liked by a dining companion) as a potential barrier to healthy eating.

The current research thus aims to extend beyond the typical taste/health goal conflict in the food domain to demonstrate a social/health goal conflict and to offer strategies to decrease this conflict. We specifically focus on how healthy eating may conflict with affiliation (or the closely related construct of “liking”; Lakin and Chartrand 2003; Lowe and Haws 2014). In eight studies, we examine (a) when this conflict occurs and (b) strategies that people can use to decrease this conflict. To preview the findings, we find that people believe and act on the belief that healthy food choice conflicts with affiliating with a dining companion who chooses unhealthy food (i.e., an “indulging consumer”) (Studies 1 to 3). Moreover, we find that indulging consumers like a person less when that person chooses healthy food (Study 4). Importantly, this
conflict can be eliminated by offering to share a healthy food choice for variety’s sake (Study 5) or by attributing a healthy food choice to a health issue (Study 6).

This research aims to make several contributions. First, by showing when a goal to affiliate (or the related goal to be liked) conflicts with healthy eating, this research contributes to the eating behavior literature by providing a more complete picture of sources of conflict with healthy eating. Namely, conflicts arise not only from characteristics of food, but also from the social context of food decision-making. Second, prior research finds that similarity in behaviors promotes affiliation more than dissimilarity (Chartrand and Bargh 1999; Hove and Risen 2009) and, particularly relevant to the present context, that matching an indulging consumer on healthiness leads to greater affiliation than mismatching (Leone, Herman, and Pliner 2008; Lowe and Haws 2014). We contribute to this literature by identifying two strategies that can make mismatching an indulging consumer on healthiness lead to as much or greater affiliation than matching. Finally, prior research suggests that people believe similarity promotes affiliation (Lakin and Chartrand 2003; Lowe and Haws 2014; Mead et al. 2011). We contribute to this literature by showing that people often believe similarity on healthiness to be more important for affiliation than similarity on flavor, another prominent dimension on which foods differ. That is, people do not believe that all attributes are equally important for promoting affiliation.

This paper is structured as follows. First, we describe the social and choice context that this research examines: a dyad (a group of two consumers) making sequential food choices. Second, we review research on how an affiliation goal affects consumers’ behavior and how consumers’ behavior affects affiliation, and we discuss how this research applies to our context. Third, we propose two strategies for mitigating the conflict between healthy eating and affiliation with an indulging consumer. Fourth, we present eight studies examining (a) when and why the
goal to affiliate conflicts with healthy eating and (b) strategies for decreasing this conflict. Finally, we discuss theoretical and practical contributions and future research directions.

**TWO CONSUMER PERSPECTIVES**

The present research considers sequential food choices in a dyad because a dyad is the simplest social context for examining conflict between affiliation and healthy eating, and because food choices often occur sequentially, with consumers taking turns ordering (Ariely and Levav 2000). Additionally, we focus on the common situation in which the first consumer to choose food selects an unhealthy option. We call this consumer the “indulging consumer.” The second consumer to order, who we refer to as the “responding consumer,” can then choose either an unhealthy option, matching on healthiness, or a healthy option, mismatching on healthiness. We focus on these situations in which the first consumer indulges because there is unlikely to be a conflict between healthy eating and being liked if the first consumer chooses a healthy option. In the General Discussion, we further discuss the situation of the first person choosing a healthy option and describe a follow-up study examining such a situation.

This research examines two consumer perspectives. From the responding consumer’s perspective, we examine how the goal to affiliate with the indulging consumer affects choice of an unhealthy or healthy option. From the indulging consumer’s perspective, we examine how the responding consumer’s choice of an unhealthy or healthy option affects liking of the responding consumer. By examining both perspectives, we combine approaches from prior research, which has separately examined how an affiliation goal affects consumer behavior (Dzhogleva and Lamberton 2014; Lakin and Chartrand 2003; Mead et al. 2011) and how consumer behavior
affects affiliation (Chartrand and Bargh 1999; Lowe and Haws 2014).

**THE “RESPONDING CONSUMER” PERSPECTIVE**

Prior research suggests that having an affiliation goal will lead the responding consumer to “match” the indulging consumer’s choice. For instance, being socially excluded, which activates affiliation motives (Maner et al. 2007), leads people to exhibit the same consumption preferences as someone they want to affiliate with (Mead et al. 2011). Relatedly, having an affiliation goal can lead people to mimic another person’s physical behaviors (Lakin and Chartrand 2003). Finally, correlational studies show that people high in sociotropy (a personality characteristic involving strong need for interpersonal acceptance; Beck, Epstein, and Harrison 1983; Robins et al. 1994) report trying to match a peer’s eating or the amount of food selected by a confederate (Exline et al. 2012). In sum, past research suggests that people act as if they believe that matching (as opposed to mismatching) another’s behavior promotes affiliation.

Although past research indicates that people believe “matching” in general is preferable to “not matching” when it comes to affiliation (Exline et al. 2012; Lakin and Chartrand 2003; Mead et al. 2011), we propose that people believe matching on healthiness to be particularly important for affiliation. Healthiness is an attribute with strong social meaning (Liu et al. 2013; Lowe and Haws 2014; Oakes and Slotterback 2004; Rozin 1996). For one, healthiness carries strong social norms and evokes strong social judgments. People believe that whether a person chooses healthy food or unhealthy food sheds light on that person’s self-control (Lowe and Haws 2014), morality (Rozin 1996), and various other characteristics, such as laziness and selfishness (Oakes and Slotterback 2004). In further support of the notion that healthiness conveys important
social information, people report that knowing the healthiness of a potential roommate’s food choices would help inform whether they would get along (Lowe and Haws 2014). Additionally, people may anticipate that choosing a healthy option could make the indulging consumer feel self-conscious. People feel self-conscious when they believe that they are deviating from a social standard and infer that others might thus evaluate them (James 2000; Leary 2007; Thompson and Hirschman 1995). Given that choosing healthier food is often socially valued and viewed as signaling positive social characteristics (Oakes and Slotterback 2004; Rozin 1996) and that consumers anticipate that being the target of upward social comparisons (e.g., for eating healthier) can harm interpersonal relationships (Exline and Lobel 1999), we propose that avoiding making an indulging consumer feel self-conscious is one reason responding consumers with an affiliation goal may match an indulging consumer on healthiness.

Not all attributes share the strong social meaning that healthiness carries. For instance, another prominent attribute on which foods differ is flavor (Inman 2001). However, unlike healthiness, flavor is not typically an attribute that carries strong social meaning. As the classic Latin saying goes, “De gustibus non est disputandum” (in English, “There is no accounting for tastes”) indicating that taste or flavor preferences are viewed as subjective and implying that people expect and accept differences along the flavor attribute (He and Bond 2015; Spiller and Belogolova 2015). Thus, we hypothesize that people believe matching an indulging consumer on healthiness to be particularly important for affiliation, and furthermore, that matching on healthiness will be prioritized over matching on flavor, a dimension that does not convey as much social meaning.

Whether people believe they need to match an indulging consumer on healthiness to increase affiliation or whether they believe they can match on any attribute (e.g., flavor) is a
question with theoretical and practical implications. From a theoretical perspective, the answer to this question extends work on the effect of an affiliation goal on behavior, which finds that an affiliation goal leads to matching in general (Exline et al. 2012; Lakin and Chartrand 2003; Mead et al. 2011), but does not delineate whether some matches are prioritized over others. From a practical perspective, if people believe they need to match on healthiness, then the conflict between healthy eating and affiliation with an indulging consumer is particularly strong (i.e., not just a matter of matching an indulging consumer on any attribute) and constituents interested in promoting healthy eating ought to be especially aware of this conflict and how to address it.

Note that if consumers view matching on healthiness as important for affiliation because healthiness is an attribute that conveys social meaning, there may be situations—albeit less common—in which flavor is also an attribute that conveys social meaning. For instance, such a situation may occur if a Chinese consumer chooses green tea ice cream at an American café on July 4th, a patriotic American holiday. In this situation, flavor could be socially meaningful for two reasons. First, although flavor choice (e.g., chocolate vs. vanilla) is not typically synonymous with any particular social identity, in this situation, flavor choice can convey social identity information (Alba 1990; Devine et al. 1999). Second, on July 4th, there may be a social norm to choose an American flavor; thus, whether the flavor choice is American might influence social judgment. Given that flavor is likely to be a socially meaningful attribute for either or both reasons in this example, consumers may believe that matching an indulging consumer on flavor is also important, in addition to matching on healthiness. Although these situations are relatively uncommon—the flavor attribute typically does not convey much social meaning—this scenario suggests a boundary condition in which other socially meaningful attributes, besides healthiness, can affect food choice when an affiliation goal is activated.
In sum, we hypothesize that people believe matching an indulging consumer on healthiness to be important for affiliation. From the perspective of promoting healthy eating, this hypothesis is troubling because it means that when a responding consumer has a healthy eating goal and a goal to affiliate with an indulging consumer, the responding consumer perceives these goals to conflict. To address a health goal, the responding consumer would need to choose a healthy option. To address an affiliation goal, the responding consumer believes that choosing an unhealthy option is better. Moreover, people likely believe that matching on flavor cannot make up for mismatching on healthiness, given that in most situations, flavor is not a socially meaningful attribute. Therefore, people likely view matching on healthiness and mismatching on flavor (vs. the other way around) as more effective for promoting affiliation.

**THE “INDULGING CONSUMER” PERSPECTIVE**

We now consider the perspective of the indulging consumer and the affiliation consequences of the responding consumer’s decision to choose an unhealthy option (i.e., match on healthiness) versus a healthy option (i.e., mismatch on healthiness). When examining these affiliation consequences, we compare the affiliation consequences of choosing an unhealthy option of a different flavor than the indulging consumer with the affiliation consequences of choosing a healthy option of a different flavor. We do not vary the flavor because using a flavor mismatch allows the “sharing for variety’s sake” strategy (discussed in greater detail subsequently) to be used regardless of the match or mismatch on healthiness.

Considerable past research suggests that matching on healthiness will promote greater liking than mismatching. Past research found that people reported liking another person less if
that person ate less (vs. more) than they did, suggesting that mismatching by engaging in healthier behavior is particularly detrimental to liking (Leone et al. 2008). More generally, extensive research shows that matching actions promote greater affiliation (measured by liking) than mismatching ones (Chartrand and Bargh 1999; Hove and Risen 2009; Lowe and Haws 2014). For instance, mimicking another person’s physical behaviors promoted affiliation (Chartrand and Bargh 1999). Similarly, matching another person’s decision to skip versus attend class led to greater affiliation, as mismatching led the class-skipper to feel guilty (Lowe and Haws 2014). The only research we are aware of suggesting that mismatching is better for affiliation finds that consumers with high need for uniqueness react negatively when matched on a symbolic product dimension (White and Argo 2011). However, assuming that consumers do not seek unique identities as the only unhealthy eater (Berger and Heath 2007), this finding does not apply to the present context. We thus suggest that a healthiness match will promote greater liking than a healthiness mismatch. One reason might be that a healthiness mismatch leads an indulging consumer to feel self-conscious (or one of the self-conscious emotions (Leary 2007) discussed further in the General Discussion) (James 2000; Thompson and Hirschman 1995). Feeling self-conscious might then lead to liking the responding consumer less (Lowe and Haws 2014). As one reader, calling herself “Not-As-Healthy Heather,” put it when she wrote on the popular website PopSugar, “I feel really insecure around [my healthy friend]… I feel like her super healthy lifestyle is putting distance between us… I don't want to lose her completely as a friend, so what can I do to make me feel less annoyed and less self-conscious?” (Fitness 2010).

**DECREASING THE CONFLICT BETWEEN HEALTHY EATING AND AFFILIATION**
How can the conflict between healthy eating and being liked by an indulging consumer be decreased? Namely, what strategies can responding consumers use so that they can choose a healthy option (mismatching an indulging consumer on healthiness) without decreasing affiliation with an indulging consumer? Next, we discuss two strategies and reasons why each may be effective at decreasing the conflict between healthy eating and affiliation.

One strategy that responding consumers may use to decrease conflict between healthy eating and affiliation is to choose a healthy option but to offer to share it with the indulging consumer if the indulging consumer wants some variety. This strategy is usable if the healthy option is relatively easy to share. This strategy is also simple to use: the responding consumer could say, “Feel free to have some of my [name of healthy option] if you want some variety.” This strategy may be effective for several reasons. First, by offering to share a healthy option for variety’s sake, the responding consumer may implicitly suggest that she views her choice as differing from the indulging consumer’s choice in terms of “variety,” rather than healthiness. Thus, an indulging consumer may be less likely to feel self-conscious about choosing a less healthy option than the responding consumer. Second, if the responding consumer explicitly attributes the sharing offer to the thought that the indulging consumer may want variety, the indulging consumer may be less likely to attribute the sharing offer to other reasons. Indeed, people often make attributions about others’ behavior to make meaning of their own behavior (Malle 2004); one alternative attribution that the indulging consumer could otherwise make is that the sharing offer is a subtle suggestion that the indulging consumer should also choose a healthy option. Such an attribution might lead to reactance for consumers who dislike being told to eat healthier (Stok et al. 2014). Third, the indulging consumer may anticipate enjoyment from variety in flavors (Inman 2001; Wansink 2004) and thus like a responding consumer who makes
this enjoyment possible. Finally, sharing food in itself may foster social connection (Belk 2010). In sum, based on this past literature, offering to share for variety’s sake may let a responding consumer choose healthier food without compromising affiliation with an indulging consumer.

Another strategy presents itself if the responding consumer has a diet-restricting health issue (e.g., diabetes) that the indulging consumer does not have. This strategy consists of the responding consumer attributing her healthy food choice to a health issue. This strategy may be effective for several reasons. First, choosing a healthy food when one has a health issue may be admirable, as many people believe that people should be responsible for their health issues (Crawford 1977). Thus, an indulging consumer may admire (and thus like) the responding consumer for addressing a health issue. Second, by explicitly attributing a healthy food choice to a health issue, responding consumers point out that they differ from indulging consumers in terms of health status. Given that eating standards can differ as a function of consumer characteristics (Bock and Kanarek 1995), the indulging consumer might believe that the responding consumer with a health issue should make a healthy choice, whereas this same standard does not apply to the indulging consumer who lacks the health issue. Thus, the indulging consumer may feel less bad about choosing an unhealthy option. In sum, based on this past literature, attributing a healthy choice to a health issue may let a responding consumer choose healthier food without compromising affiliation with an indulging consumer.

OVERVIEW OF STUDIES

Eight studies test our theory that healthy eating conflicts with affiliation with an indulging consumer and test the effectiveness of two strategies to decrease this conflict. The
Table defines the “responding consumer” and “indulging consumer” and indicates which studies examine each consumer’s perspective. Studies 1 to 3 test the hypothesis that people believe choosing a healthy option will hinder affiliation with an indulging consumer and that an affiliation goal may thus increase unhealthy food choice. Studies 4 to 6 focus on the indulging consumer’s perspective, testing the hypothesis that healthy eating hinders affiliation with an indulging consumer and testing the effectiveness of two strategies that responding consumers can use to decrease the conflict between healthy eating and affiliation with an indulging consumer.

**TABLE**

DEFINITIONS OF “RESPONDING CONSUMER” AND “INDULGING CONSUMER” AND STUDIES THAT EXAMINE EACH CONSUMER’S PERSPECTIVE

<table>
<thead>
<tr>
<th>Responding Consumer</th>
<th>Indulging Consumer</th>
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<tbody>
<tr>
<td>Definition</td>
<td>Definition</td>
</tr>
<tr>
<td>Second consumer to order, can choose either an unhealthy option or a healthy option</td>
<td>First consumer to order, chooses an unhealthy option</td>
</tr>
<tr>
<td>Studies</td>
<td>Studies</td>
</tr>
<tr>
<td>Participant takes this consumer’s perspective in Studies 1 to 3</td>
<td>Participant takes this consumer’s perspective in Studies 4 to 6</td>
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**STUDY 1: RESPONDING CONSUMERS’ BELIEFS ABOUT AFFILIATION**

Study 1 examines beliefs about the impact on affiliation with the indulging consumer if the responding consumer chooses to match the indulging consumer on healthiness and/or flavor. We hypothesized that responding consumers believe matching on healthiness in particular will benefit affiliation, whereas matching on flavor will have little (or less) effect on affiliation.

Method
Participants and design. Fifty-three participants (49.1% female; \( M_{\text{age}} = 37.57 \)) recruited from Amazon’s Mechanical Turk (MTurk) completed this study, which had a 2 (healthiness: match, mismatch) \( \times \) 2 (flavor: match, mismatch) + 1 (ordering no food) completely within-subjects design (53 participants in each cell). Participants were eligible for this study and the other online studies in this paper if they were ages 18+ (according to self-report) and located in the United States (according to MTurk’s qualifications).

Procedure. Participants read: “In the following situation, imagine that you and another person are at a small café in the afternoon. You plan to sit at the small café and chat for the next hour or so. You both look at the dessert display. The other person orders first and selects a bowl of full-fat chocolate ice cream. If you decide to order dessert, the options you can order are: low-fat chocolate ice cream, full-fat chocolate ice cream, low-fat vanilla ice cream, and full-fat vanilla ice cream.” Participants then indicated, for each of the five potential choices (not ordering any ice cream, ordering one of the four ice cream options), how much they thought the other person would like them (1 = not at all, 6 = very much), as liking is a construct linked closely to affiliation (Freeman 1992; Lakin and Chartrand 2003; Lowe and Haws 2014; Yabar et al. 2006), and how self-conscious they thought the other person would feel (1 = not at all, 6 = very much).

Results and Discussion

Anticipated affiliation. A 2 (healthiness: match, mismatch) \( \times \) 2 (flavor: match, mismatch) repeated-measures ANOVA was conducted on anticipated affiliation. See Figure 1(a). As predicted, there was a main effect of healthiness match (\( F(1, 52) = 25.08, p < .001 \)). People
thought they would be liked more if they matched \((M = 4.86)\) versus mismatched on healthiness \((M = 4.17)\). There was no main effect of flavor match \((F(1, 52) = .63, p = .430)\) and no interaction between healthiness match and flavor match \((F(1, 52) = 1.67, p = .201)\).

If the responding consumer did not order any ice cream, anticipated affiliation was fairly low \((M = 4.00)\). According to paired \(t\)-tests, people thought they would be liked similarly if they ordered no ice cream as if they ordered low-fat chocolate ice cream \((t(52) = -.71, p = .480)\) and would be liked marginally significantly less if they ordered no ice cream than if they ordered low-fat vanilla ice cream \((t(52) = -1.76, p = .085)\).

FIGURE 1

STUDY 1: BELIEFS ABOUT EFFECT OF MATCHING ON HEALTHINESS AND MATCHING ON FLAVOR ON AFFILIATION (PANEL A) AND INDULGING CONSUMER FEELING SELF-CONSCIOUS (PANEL B)
**Anticipated self-conscious feelings.** A 2 (healthiness: match, mismatch) × 2 (flavor: match, mismatch) repeated-measures ANOVA was also conducted on beliefs about how self-conscious the other person would feel. See Figure 1(b). There was a main effect of healthiness match ($F(1, 52) = 47.52, p < .001$), such that people anticipated that the other person would feel less self-conscious if they matched on healthiness ($M = 1.74$) than if they did not match on healthiness ($M = 3.24$). There was no main effect of flavor match ($F(1, 52) = .51, p = .478$) and no significant interaction between healthiness match and flavor match ($F(1, 52) = .09, p = .771$).

If the responding consumer did not order any ice cream, people anticipated that the indulging consumer would feel quite self-conscious ($M = 3.91$). According to paired $t$-tests, people anticipated that the other person would feel even more self-conscious if they ordered no ice cream than if they ordered low-fat chocolate ice cream ($t(52) = 3.11, p = .003$) or low-fat vanilla ice cream ($t(52) = 3.58, p = .001$).

**Correlation between anticipated affiliation and self-conscious feelings.** We then examined the correlation between anticipated affiliation and self-conscious feelings, separately for each level of the within-subjects variable. All correlations were negative and significant, as predicted, ranging from $r = -.42$ ($p = .002$) to $r = -.65$ ($p < .001$).

**Mediation.** Finally, we used methods for testing mediation in within-subjects designs (Judd, Kenny, and McClelland 2001; Pennington and Roese 2003) to examine whether the differences in anticipated self-conscious feelings might account for the differences in anticipated affiliation. We focused on the main 2 (healthiness: match, mismatch) × 2 (flavor: match, mismatch) within-subjects design. Given no main effect of flavor matching on anticipated affiliation ($p = .430$) and no interaction between healthiness matching and flavor matching ($p = .201$), we collapsed across flavor matching to focus on the effect of healthiness matching ($p <$
We first created four measures: 1) the average of the anticipated liking from choosing low-fat chocolate ice cream and low-fat vanilla ice cream, 2) the average of the anticipated liking from choosing full-fat chocolate ice cream and full-fat vanilla ice cream, 3) the average of the anticipated self-consciousness from choosing low-fat chocolate ice cream and low-fat vanilla ice cream, and 4) the average of the anticipated self-consciousness from choosing full-fat chocolate ice cream and full-fat vanilla ice cream. We then regressed the difference in the two anticipated liking scores (anticipated liking from choosing full-fat ice cream – anticipated liking from choosing low-fat ice cream) on two predictors: 1) the sum of each participant’s anticipated self-consciousness scores for low-fat ice cream and for full-fat ice cream, and 2) the difference in each participant’s anticipated self-consciousness scores for low-fat ice cream and for full-fat ice cream. The regression coefficient for the anticipated self-consciousness difference predictor was significant ($B = -.46, SE = .07, \beta = -.73, t = -6.97, p < .001$), indicating mediation of anticipated liking by anticipated self-conscious feelings.

Discussion. Consumers believed that choosing an unhealthy option (thereby matching on healthiness) would lead an indulging consumer to like them more. In contrast, consumers did not believe that matching on flavor would lead the indulging consumer to like them more. Having these beliefs about the affiliation benefits of matching on healthiness was linked to believing that mismatching on healthiness would make an indulging consumer feel self-conscious, whereas mismatching on flavor would not. These findings are important because they show that people do not believe all types of matches are equally important for affiliation. Instead, people view matches on healthiness—an attribute with considerable social meaning—to be critical for affiliation. Thus, unfortunately from the perspective of promoting healthy eating, consumers think they should choose something unhealthy to affiliate with an indulging consumer.
Study 1 also showed that people believe not ordering any dessert to be, if anything, worse for affiliation than choosing a healthy dessert. Indeed, not ordering any dessert might be considered a more extreme form of mismatching an indulging consumer on healthiness than ordering a healthy food. In subsequent studies, we thus focus on situations in which both consumers in the dyad order food. We do so for two reasons. First, because choosing a healthy food is a less extreme form of mismatching on healthiness, examining a healthy food choice (vs. no food choice) offers a more conservative test of the hypothesis that healthy eating conflicts with affiliation with an indulging consumer. Second, if the responding consumer chooses a food, how similar this food’s flavor is to the flavor of the indulging consumer’s food can be varied. Being able to vary flavor similarity is helpful when we later show in Study 3 that it is not the case that people always prioritize matching on healthiness over flavor for affiliation.

**STUDY 2A: EFFECT OF AN AFFILIATION GOAL ON MATCHING**

Study 1 indicates that responding consumers believe they need to choose an unhealthy option to affiliate with an indulging consumer. Study 2a tests the hypothesis that this belief can lead responding consumers to make more unhealthy food choices. Study 2a does so by manipulating whether responding consumers have both a health goal and an affiliation goal or a health goal alone. The dependent variable is whether participants choose an unhealthy option (that matches the indulging consumer on healthiness but not flavor) or a healthy option (that matches the indulging consumer on flavor but not healthiness). These are the only two options provided to test our hypothesis that consumers care especially about matching on healthiness in particular when they have an affiliation goal. Based on considerable work showing that
healthiness is a particularly socially meaningful attribute (Oakes and Slotterback 2004; Rozin 1996), we predicted that having an affiliation goal would increase the likelihood that people choose the unhealthy option over the healthy option.

Method

Participants and design. Due to participant pool limitations, data for Study 2a are being collected in two waves. The first wave of data collection is complete, and the preliminary results from the first wave are reported here. Participants were recruited from a business school’s lab participant pool to participate in a dyad study for which we required that dyad members not know their partner to be eligible. Ninety-six participants met these eligibility criteria. Six participants were excluded from analysis for the following pre-determined reasons: one participant had dietary restrictions keeping her from eating one or more of the snacks served; two participants sitting next to each other talked during the study and discussed getting different snacks to share; two participants expressed suspicion that their partner’s choice was not real, and one participant’s responses were not recorded due to a computer malfunction. Thus, 90 participants remained for analysis (70.0% female; \( M_{age} = 20.70 \), \( M_{age} \) excludes one participant who reported an implausible age of five).

Procedure. Participants were recruited to participate in a group survey session for compensation of $12 each. Participants were asked not to eat for three hours prior to the session. When participants arrived at the lab, an experimenter discreetly assigned participants to same-sex dyads, to control for cross-gender effects in food-based interactions (Mori, Chaiken, and Pliner 1987; Wardle et al. 2004). If participants appeared to know each other, the experimenter
avoided partnering them. Once participants were partnered, they were seated at individual, numbered computer stations in a study room. Participants were seated so that their station was across the room from their partner’s station. Figure 2 depicts this set-up.

FIGURE 2

STUDY 2: STUDY ROOM SET-UP

Participants first read two articles. The first article was a filler article (an excerpt from a New York Times article titled “Apple and Beats Developing Streaming Music Service to Rival Spotify”). The second article contained tips for engaging in healthy eating (adapted from a health goal salience manipulation used by Haws and Winterich (2013)). Participants were asked several questions after each article to encourage careful reading.

Participants were then told that they were being partnered with another participant for a choice task. Participants in the affiliation goal condition were additionally told that, after the choice task, they would also interact with their partner “on a cooperative task for which it is very important to get along and work together well” (manipulation adapted from Lakin and Chartrand
2003). An experimenter then told all participants that they were partnered with the participant seated across from them. Participants were asked to turn around without speaking and to take note of who they were partnered with. Participants then entered both their own seat number and their partner’s seat number into the survey on their computer. Entering both numbers provided believability for our cover story (used in the subsequent choice task) that participants’ partners were randomly selected to choose first and that they chose a particular snack.

For the choice task, all participants were told that each dyad had a set of three snacks to choose from: regular BBQ chips, baked BBQ chips, and regular cheddar & sour cream chips. Participants were shown photos of regular Lays BBQ chips, baked Lays BBQ chips, and regular Lays cheddar & sour cream chips. Participants were told that one person would choose a snack first, and the other person in the dyad would choose from the remaining two snacks. Participants were told that they would actually receive and consume the snack they chose during the study. Participants were then told to click a button to randomly determine who would select first. All participants were shown a screen telling them that they were going to select a snack second. All participants were then asked to wait, ostensibly while their partner chose a snack.

After a 30 second delay, participants saw a screen telling them that their partner chose the regular BBQ chips (i.e., an indulging choice). Thus, all participants took on the responding consumer’s role, as their partners ostensibly were indulging consumers. Participants were then asked to choose either a healthy option (baked BBQ chips; matching on flavor, mismatching on healthiness) or an unhealthy option (regular cheddar & sour cream chips; matching on healthiness, mismatching on flavor). This choice served as the dependent variable. Given the time delay that took place before making this choice, participants in the affiliation goal condition were reminded before making this choice that they would be interacting on a subsequent
cooperative task for which it would be important that the other participant likes them, gets along with them, and works together well with them (adapted from Lakin and Chartrand 2003).

All participants then received a bowl containing a pre-weighed one-ounce serving of their chosen snack. Upon receiving their snack, participants were allowed to eat it for the remainder of the study, which consisted of watching a 10-minute episode of a popular Nickelodeon children’s television show (Hey Arnold) and answering the remaining questions. The remaining questions were about the television show, the snacks, their dyad partners, and demographics. The final questions gauged whether participants had interacted with their assigned partners before this study, whether they felt any aspect of the study seemed strange, and what they thought the purpose of the study was. After completing this funneled debriefing (Chartrand and Bargh 1996), participants in the affiliation goal condition were told that the cooperative task would not actually take place in order to keep the study within the allotted time. After participants left, experimenters measured how many ounces of snack were left over by each participant (if any).

Results and Discussion

*Snack choice.* A binary logistic regression with affiliation goal as the predictor was conducted on snack choice. There was a marginally significant effect ($B = .84$, Wald $\chi^2(1) = 3.34, p = .068$), such that participants were more likely to choose the unhealthy option in the affiliation goal condition (43.5%) than in the no affiliation goal condition (25.0%).

*Snack consumption.* The majority of participants (63.3%) participants ate the entire snack they selected, 18.9% ate at least half of the snack but not the entire snack, and 17.8% did not eat at least half of the snack. The percentage consuming the entire snack did not differ across
conditions (63.6% in the control condition consumed the entire snack vs. 63.0% in the affiliation goal condition; $\chi^2(1) = .003, p = .953$).

*Caloric consumption.* Based upon the Nutrition Facts label for each snack (one ounce of the unhealthy snack = 160 calories, one ounce of the healthy snack = 120 calories), we calculated the snack calories each participant consumed in the study. Caloric consumption was marginally significantly higher in the affiliation goal condition than in the control condition ($M = 116$ calories vs. $M = 99$ calories; $t$-test: $t(88) = 1.70, p = .092$).

*Discussion.* Study 2a built upon the beliefs identified in Study 1, showing that when consumers have an affiliation goal, they may neglect a healthy eating goal and choose an unhealthy option (that matches the indulging consumer on healthiness, but not on flavor) over a healthy option (that matches the indulging consumer on flavor, but not on healthiness). Additionally, by pitting matching on healthiness against matching on flavor, we found that people act on the belief that matching on healthiness is more meaningful for affiliation than matching on flavor. Finally, participants tended to eat either the entire food they chose or most of it; thus, choosing an unhealthy option translated into consuming marginally more calories.

**STUDY 2B: EFFECT OF AN AFFILIATION GOAL ON MATCHING**

Study 2b expands the number of available options, such that participants could match on healthiness alone, flavor alone, neither, or both. Study 2b thus tests our hypothesis that an affiliation goal will still lead to matching on healthiness when the full array of four choice options is available. We did not have a hypothesis about whether participants with an affiliation goal would also prefer to match on flavor (i.e., in addition to healthiness).
Method

Participants and design. Two hundred and four participants (59.8% female; $M_{age} = 34.21$) recruited from MTurk completed this study, which had a 2 (affiliation goal: yes, no) group between-subjects design.

Procedure. All participants read the following: “Imagine that you and another person are at a small cafe in the afternoon. Your boss was supposed to take this person to the cafe to get ice cream but something came up at the last minute and he asked you to take this person instead.” Participants then read: “The other person orders a bowl of chocolate ice cream.” Participants were then shown a photo of a pint of Häagen-Dazs chocolate ice cream. Participants then read: “It is your turn to order next. The options are light chocolate ice cream, light vanilla ice cream, chocolate ice cream, and vanilla ice cream.” Participants then saw photos of a pint of Häagen-Dazs light chocolate ice cream, a pint of Häagen-Dazs light vanilla ice cream, a pint of Häagen-Dazs chocolate ice cream, and a pint of Häagen-Dazs vanilla ice cream. All participants were then told: “Imagine that you’re trying to eat a healthier diet.”

In the affiliation goal condition, participants were additionally told, “Imagine also that this person is important to your boss, so it is very important that you make this person feel comfortable, as you need this person to like you and enjoy your company.” In the no affiliation goal condition, participants were instead told that this person is “not particularly important to your boss, so you do not need to go out of your way to make this person feel comfortable, as you don’t need this person to like you or enjoy your company.”

Participants were then asked which option they would choose for themselves (light
chocolate ice cream, light vanilla ice cream, chocolate ice cream, or vanilla ice cream).

Results and Discussion

*Snack choice.* Choice differed significantly across goal conditions ($\chi^2 (3) = 21.58, p < .001$). In the affiliation goal condition, 15.8% chose light chocolate ice cream, 20.8% chose light vanilla ice cream, 36.6% chose chocolate ice cream, and 26.7% chose vanilla ice cream. In the no affiliation goal condition, 33.0% chose light chocolate ice cream, 31.1% chose light vanilla ice cream, 11.7% chose chocolate ice cream, and 24.3% chose vanilla ice cream. See Figure 3.

STUDY 2B: EFFECT OF AFFILIATION GOAL ON MATCHING ON HEALTHINESS AND FLAVOR

To test our hypothesis that an affiliation goal leads to matching on healthiness even when the full array of four options is available to choose from, we compared the percentage choosing a healthy option (light chocolate ice cream or light vanilla ice cream) with the percentage choosing an unhealthy option (chocolate ice cream or vanilla ice cream). A 2 (affiliation goal: yes, no) binary logistic regression conducted on snack choice (unhealthy option, healthy option) was significant ($B = 1.13$, Wald $\chi^2(1) = 14.97, p < .001$). In the affiliation goal condition, 63.4%
chose an unhealthy option; in the no affiliation goal condition, 35.9% chose an unhealthy option.

We also examined whether participants with an affiliation goal would choose to match on flavor when the full array of four choice options was available. To do so, we first compared the percentage choosing the same flavor as their dining companion with the percentage choosing a different flavor. A 2 (affiliation goal: yes, no) group binary logistic regression conducted on snack choice (same flavor, different flavor) was not significant ($B = .31, \text{Wald } \chi^2(1) = 1.24, p = .265$). In the affiliation goal condition, 52.5% chose the same flavor; in the no affiliation goal condition, 44.7% chose the same flavor. We also compared the percentage of flavor matches by condition separately for participants who matched on healthiness (n = 101) and those who did not match on healthiness (n = 103). Among those who matched on healthiness, more participants chose the flavor-match option in the affiliation goal condition (57.8%; 37/64 participants) compared to the no affiliation goal condition (32.4%; 12/37 participants; $B = 1.05, \text{Wald } \chi^2(1) = 5.87, p = .015$). Among those who did not match on healthiness, a similar percentage chose the flavor-match option in the affiliation goal condition (43.2%; 16/37 participants) and in the no affiliation goal condition (51.5%; 34/66 participants; $B = .33, \text{Wald } \chi^2(1) = .65, p = .421$).

**Discussion.** Study 2b’s main finding is that the tendency to match on healthiness when having a goal to affiliate with an indulging consumer persists when the full array of four options (match on healthiness only, match on flavor only, match on both healthiness and flavor, match on neither healthiness nor flavor) is available to choose from. That is, having an affiliation goal (vs. no affiliation goal) increased choice of the options matching on healthiness. Although we did not have a specific prediction about whether participants would additionally match on flavor, we found that among people who matched on healthiness, people with an affiliation goal were more likely to match on flavor than people without an affiliation goal, whereas among people who did
not match on healthiness, people with an affiliation goal were similarly likely to match on flavor as people without an affiliation goal.

**STUDY 2C: EFFECT OF AN AFFILIATION GOAL ON MATCHING**

Study 2c tests for replication of Study 2b’s finding that an affiliation goal leads to matching on healthiness when the full array of four choice options is available, but uses a different operationalization of healthiness. Whereas the prior studies, including Study 2b, operationalized healthiness using light versus regular versions of indulgent products, Study 2c instead operationalizes healthiness using small versus large portions of indulgent products.

Method

*Participants and design.* Two hundred participants (46.5% female; $M_{age} = 34.42$) from MTurk completed this study, which had a 2 (affiliation goal: yes, no) group between-subjects design.

*Procedure.* The procedure for Study 2c was similar to the procedure for Study 2b. The only difference between studies was that participants in Study 2c were told that the other person ordered a large cup of chocolate ice cream and that they then had the option of ordering a large cup of chocolate ice cream, a large cup of vanilla ice cream, a small cup of chocolate ice cream, or a small cup of vanilla ice cream.

Results and Discussion
**Snack choice.** Choice differed significantly across goal conditions ($\chi^2 (3) = 32.57, p < .001$). In the affiliation goal condition, 18.4% chose a small vanilla ice cream, 35.7% chose a small chocolate ice cream, 11.2% chose a large vanilla ice cream, and 34.7% chose a large chocolate ice cream. In the no affiliation goal condition, 45.1% chose a small vanilla ice cream, 43.1% chose a small chocolate ice cream, 3.9% chose a large vanilla ice cream, and 7.8% chose a large chocolate ice cream. See Figure 4.

FIGURE 4

STUDY 2C: EFFECT OF AFFILIATION GOAL ON MATCHING ON HEALTHINESS AND FLAVOR

To test for replication of Study 2b’s finding that an affiliation goal leads to matching on healthiness even when the full array of four options is available, we compared the percentage choosing a healthy option (small ice cream) with the percentage choosing an unhealthy option (large ice cream). A 2 (affiliation goal: yes, no) binary logistic regression conducted on snack choice (unhealthy option, healthy option) was significant, $B = 1.85$, Wald $\chi^2(1) = 25.29$, $p < .001$. In the affiliation goal condition, 45.9% chose an unhealthy option; in the no affiliation goal condition, 11.8% chose an unhealthy option.

We also examined whether an affiliation goal would lead to matching on flavor. To do
so, we first conducted a 2 (affiliation goal: yes, no) group binary logistic regression on snack choice (same flavor, different flavor). This regression was significant ($B = .83$, Wald $\chi^2(1) = 7.77, p = .005$). In the affiliation goal condition, 70.4% chose the same flavor; in the no affiliation goal condition, 51.0% chose the same flavor. We also compared the percentage of flavor matches by affiliation goal condition separately for those who matched on healthiness ($n = 57$) and those who did not match on healthiness ($n = 143$). Among those who matched on healthiness, a similar percentage chose the flavor-match option in the affiliation goal condition (75.6%; 34/45 participants) and the no affiliation goal condition (66.7%; 8/12 participants; $B = .44$, Wald $\chi^2(1) = .38, p = .536$). Among those who did not match on healthiness, a larger percentage of participants chose the flavor-match option in the affiliation goal condition (66.0%; 35/53 participants) compared to the no affiliation goal condition (48.9%; 44/90 participants; $B = .71$, Wald $\chi^2(1) = 3.91, p = .048$).

Discussion. Study 2c replicated Study 2b’s main finding that an affiliation goal increases matching on healthiness when four choice options are available, but generalized this finding to a situation with a different operationalization of healthiness. Comparing across these two studies, a higher percentage of participants choose the “healthy” option overall in Study 2c, perhaps indicating that consumers find small portion sizes of indulgent foods to be more attractive than light versions of indulgent foods. Like Study 2b, Study 2c also found evidence that an affiliation goal increases matching on flavor, but unlike Study 2b, this increase occurred among those who did not match on healthiness (in Study 2b, it occurred among those who did match on healthiness). Overall though, Study 2c’s main finding is that an affiliation goal again led to increased matching on healthiness, even though healthiness was operationalized differently.
STUDY 3: WHEN A FLAVOR MATCH IS ALSO MEANINGFUL FOR AFFILIATION

Study 3 tests whether the effect identified in Study 2a is mitigated if the flavor attribute also conveys social meaning. The purpose of examining this boundary condition is to test our hypothesis that although matching on healthiness is typically important for affiliation, it is not the case that matching on flavor is never important for affiliation. Rather, there may be some situations—albeit rare—in which flavor is also a socially meaningful attribute, such that matching on flavor could also be important for affiliation. More broadly speaking, when attributes convey social meaning, they are viewed as important for affiliation.

The rationale for our prediction that Study 2a’s effect will be mitigated when flavor can convey social meaning is as follows. Although consumers might still feel drawn towards the unhealthy option because matching on healthiness is viewed as important for affiliation, they now may also feel a draw (in the opposite direction) towards the healthy option because matching on flavor is also viewed as important for affiliation. Assuming the draw in the opposite direction is sufficiently strong, the likelihood of choosing the healthiness match (the unhealthy option) over the flavor match (the healthy option) should be mitigated.

Although Study 3’s main aim is to test our hypothesis that people do not always indiscriminately match on healthiness over other attributes when they have an affiliation goal, Study 3 also follows up on the anticipated self-conscious feelings results in Study 1. Specifically, Study 3 tests whether one reason that an affiliation goal leads to increased matching on healthiness (in the common situation in which flavor is not a socially meaningful attribute) is because people do not want to make an indulging consumer feel self-conscious.
Method

Participants and design. Two hundred and two participants (52.0% female; $M_{\text{age}} = 34.43$) recruited from MTurk completed this study, which had a 2 (affiliation goal: yes, no) × 2 (flavor as socially meaningful attribute: no, yes) group between-subjects design.

Procedure. All participants read the following: “Imagine that it is July 4th, and you and another person, who has recently arrived in the USA from China, are at a small café in the afternoon. Your boss was supposed to take this person to the café to get ice cream but something came up at the last minute and he asked you to take this person instead.”

Participants in the flavor-not-socially-meaningful-attribute condition then read: “The other person orders a bowl of full-fat chocolate ice cream. It is your turn to order next. The two options that are left are low-fat chocolate ice cream and full-fat vanilla ice cream.” Participants in the flavor-socially-meaningful-attribute condition then read: “The other person orders a bowl of full-fat green tea ice cream. It is your turn to order next. The two options that are left are low-fat green tea ice cream and full-fat vanilla ice cream.” In this situation, flavor is socially meaningful for two reasons. First, on July 4th, there may be a social norm to choose an American flavor; thus, whether the flavor choice is American might impact social judgment. Second, in this situation, flavor can convey information about social identity (Alba 1990; Devine et al. 1999).

As in Studies 2b and 2c, all participants were then told: “Imagine that you’re trying to eat a healthier diet.” Next, depending on randomly assignment, participants were told either that it was important or unimportant to affiliate with this person (same wording as Studies 2b and 2c).

Participants were then asked, “Which option would you order for yourself?” Participants in the flavor-not-socially-meaningful-attribute condition had the options of low-fat chocolate ice
cream and full-fat vanilla ice cream. Participants in the flavor-socially-meaningful-attribute condition had the options of low-fat green tea ice cream and full-fat vanilla ice cream. Thus, the dependent variable was whether participants chose to match on healthiness alone (by choosing the unhealthy option: full-fat vanilla ice cream) or on flavor alone (by choosing the healthy option: the low-fat version of the ice cream chosen by the indulging consumer).

Participants then responded to a mediator measure that we proposed might help explain why an affiliation goal leads participants to choose to match on healthiness (in the flavor-not-socially-meaningful-attribute condition). Specifically, participants responded to the statement: “I chose the [chosen option displayed] because I didn't want the other person to feel self-conscious about their ice cream choice” (1 = not at all, 6 = very much so).

Participants also responded to question checking that in the flavor-socially-meaningful attribute condition, people no longer viewed matching on healthiness (and mismatching on flavor) as the better option for making the indulging consumer feel comfortable. Specifically, participants were asked, “Did you think the other person would feel more comfortable if you ordered low-fat [chocolate / green tea ice cream, depending on condition] or if you ordered full-fat vanilla ice cream?” (1 = Definitely low-fat [chocolate / green tea ice cream, depending on condition], 6 = Definitely full-fat vanilla ice cream).

Results and Discussion

Manipulation check. Participants’ responses on whether they thought the other person would feel more comfortable if they matched on flavor or on healthiness were analyzed using a 2 (affiliation goal: yes, no) × 2 (flavor as socially meaningful attribute: no, yes) ANOVA. There
was no main effect of affiliation goal ($F(1, 198) = 2.04, p = .155$) and no interaction between affiliation goal and the social meaningfulness of flavor ($F(1, 198) = .10, p = .750$). As expected, there was a main effect of the social meaningfulness of flavor ($F(1, 198) = 8.40, p = .004$). When flavor was not socially meaningful, people viewed matching on healthiness as better for making the other person feel comfortable ($M = 4.17$; significantly greater than the midpoint of 3.5, one-sample $t$-test: $t(102) = 4.97, p < .001$). When flavor was socially meaningful, people no longer viewed matching on healthiness as better for making the other person feel comfortable ($M = 3.59$; not different from the midpoint of 3.5, one-sample $t$-test: $t(98) = 0.57, p = .572$).

**Snack choice.** A 2 (affiliation goal: yes, no) × 2 (flavor as socially meaningful attribute: yes, no) binary logistic regression on snack choice (unhealthy option, healthy option) revealed a significant interaction ($B = -1.20$, Wald $\chi^2(1) = 4.25, p = .039$). See Figure 5.

**FIGURE 5**

**STUDY 3: CHOICE OF UNHEALTHY OPTION AS A FUNCTION OF AFFILIATION GOAL AND SOCIAL MEANINGFULNESS OF FLAVOR ATTRIBUTE**

As in Study 2a, when flavor was not socially meaningful, people were more likely to choose the unhealthy option when they did (58.0%) versus did not (30.2%) have an affiliation goal ($B = 1.16$, Wald $\chi^2(1) = 7.86, p = .005$). In contrast, when flavor was socially meaningful, people were similarly likely to choose the unhealthy option when they did (42.0%) as when they...
did not have an affiliation goal (42.9\%; B = -.04, Wald $\chi^2(1) = .01, p = .931$).

**Moderated mediation.** We then tested the underlying mechanism through a moderated mediation analysis (Hayes 2013, PROCESS model 14). Specifically, we tested whether the desire to avoid making the indulging consumer feel self-conscious mediated the relationship between an affiliation goal and matching on healthiness when flavor was not a socially meaningful attribute (but not when flavor was a socially meaningful attribute). See Figure 6.

**FIGURE 6**

**STUDY 3: MODERATED MEDIATION MODEL**

As expected, mediation occurred when flavor was not socially meaningful (95% CI: [.7174, 1.9910]) but not when flavor was socially meaningful (95% CI: [-.2082, .5247]). An index of moderated mediation indicated that the indirect effects differed across the social meaningfulness of the flavor attribute (95% CI: [.5669, 1.8932]). Specifically, participants reported a greater motive to avoid making the indulging consumer feel self-conscious when they had an affiliation goal ($M = 3.29$) versus when they did not ($M = 1.75$; $t$-test not assuming equal variances: $t(169) = 6.26, p < .001$), an effect that did not vary by whether flavor was a socially meaningful attribute ($F(1, 198) = .23, p = .631$). As Figure 6 shows, the motive to avoid making the indulging consumer feel self-conscious was linked with increased choice of the unhealthy option when flavor was not a socially meaningful attribute (significant, positive $b_{\text{flavor-not-meaningful}}$).
B = .83, Wald $\chi^2(1) = 26.26, p < .001$) but not when flavor was a socially meaningful attribute (non-significant $b_{\text{flavor-meaningful}}^{}; B = .08, \text{Wald } \chi^2(1) = .59, p = .444$).

Discussion. Study 3 demonstrates a boundary condition to Study 2a’s effect, showing that although an affiliation goal increases choice of an unhealthy option (that matches an indulging consumer on healthiness but not flavor) over a healthy option (that matches an indulging consumer on flavor but not healthiness) in the common situation in which flavor is not a socially meaningful attribute, this effect does not occur when flavor is a socially meaningful attribute. Study 3’s mediation results also built upon Study 1’s mediation results by showing that when flavor is not socially meaningful, one reason that an affiliation goal leads to matching on healthiness is to avoid making the indulging consumer feel self-conscious. We discuss other potential reasons at play in the General Discussion.

Overall, Studies 1 to 3 showed that responding consumers perceive healthy eating to conflict with affiliation with an indulging consumer and that this conflict could increase unhealthy food choice. From a theoretical perspective, these studies showed that an affiliation goal does not lead to matching on all attributes equally (Exline et al. 2012; Lakin and Chartrand 2003; Mead et al. 2011); rather, matches on socially meaningful attributes are prioritized.

**STUDY 4: AFFILIATION CONSEQUENCES OF MATCHING ON HEALTHINESS**

Whereas Studies 1 to 3 focused on the responding consumer’s perspective, Studies 4 to 6 focus on the indulging consumer’s perspective. Study 4 tests the hypothesis that an indulging consumer will indeed like a responding consumer less if the responding consumer chooses a healthy (vs. an unhealthy) option. This hypothesis follows clearly from past research (Chartrand
and Bargh 1999; Hove and Risen 2009; Leone et al. 2008; Lowe and Haws 2014) but is important to test as it forms the basis for Studies 5 and 6, which test ways to mitigate this effect.

Method

*Participants and design.* Fifty-seven participants (31.6% female; $M_{\text{age}} = 31.09$) recruited from MTurk completed this study, which had a 2 (matching on healthiness, mismatching on healthiness) group between-subjects design.

*Procedure.* All participants read the following: “Imagine that you and another person are at a small café in the afternoon. This is your first time meeting this person. An acquaintance of yours was supposed to take this person, a distant cousin, to get ice cream but had to work at the last minute and asked you to take this person to get ice cream instead. You both look at the dessert display. Imagine that you select a bowl of full-fat chocolate ice cream.”

In the matching on healthiness condition, participants were told that the other person then selected full-fat vanilla ice cream. In the mismatching on healthiness condition, participants were told that the other person then selected light (low-fat, reduced sugar) vanilla ice cream.

Participants then indicated how much they would like the other person (“I would like this person”; 1 = *not at all*, 9 = *very much*), as liking has been used as a measure of affiliation in prior research (Lakin and Chartrand 2003; Lowe and Haws 2014). Finally, participants indicated how self-conscious they would feel (“I would feel self-conscious about my full-fat chocolate ice cream”; 1 = *not at all*, 9 = *very much*).

Results and Discussion
Results. A t-test (not assuming equal variances) on affiliation was significant ($t(45) = 3.88, p < .001$); participants reported that they would like the other person more if the other person matched ($M = 6.59$) versus mismatched ($M = 5.33$) them on healthiness. A bootstrapping mediation test (Hayes 2013) revealed that feeling self-conscious mediated this effect at the $p < .10$ level (90% CI: [.0015, .5416]), indicating some support for the proposed mediation model. Specifically, mismatching led to feeling more self-consciousness than matching ($M = 4.10$ vs. $1.67$; $t$-test (not assuming equal variances): $t(48) = -4.48, p < .001$). Feeling more self-conscious, in turn, was linked with liking the other person less ($\beta = -.37, t = -2.99, p = .004$).

Discussion. Study 4 showed that there is a conflict between healthy eating and affiliation with an indulging consumer, which may occur in part because indulging consumers feel self-conscious when responding consumers make a healthy food choice. This study suggests, consistent with other research (Chartrand and Bargh 1999; Hove and Risen 2009; Leone et al. 2008; Lowe and Haws 2014), that consumers who want to be liked by indulging consumers should choose a similarly unhealthy food (matching on healthiness) rather than a healthier food.

STUDY 5: OFFERING TO SHARE FOR VARIETY’S SAKE

The last two studies test the effectiveness of practical strategies for decreasing the conflict between healthy eating and affiliation, such that responding consumers can make a healthy food choice without decreasing affiliation with an indulging consumer. Study 5 tests the hypothesis that making a healthy food choice and offering to share it for variety’s sake with the indulging consumer can lead to as much affiliation as making an unhealthy food choice but not
offering to share it with the indulging consumer. To test this hypothesis, Study 5 manipulates both a) whether a responding consumer chooses a healthy option or an unhealthy option and b) whether or not a responding consumer offers to share his/her chosen option for variety’s sake.

There are two focal comparisons. First, comparing the two no-offer-to-share conditions, we test for replication of Study 4’s finding that affiliation is higher when the responding consumer chooses an unhealthy option versus a healthy option. Second, comparing the healthy option with offer to share condition with the unhealthy option but no offer to share condition, we test our hypothesis that affiliation will be at least as high in the healthy option with offer to share condition as in the unhealthy option but no offer to share condition.

Method

*Participants and design.* Four hundred participants (43.0% female; *M* _age_ = 32.16) from MTurk completed this study, which had a 2 (matching on healthiness, mismatching on healthiness) × 2 (offering to share for variety’s sake: no, yes) group between-subjects design.

*Procedure.* All participants read the following: “Imagine that you and another person are at a small café in the afternoon. This is your first time meeting this person. An acquaintance of yours was supposed to take this person, a distant cousin, to get dessert but had to work at the last minute and asked you to take this person to get dessert instead. You both look at the dessert display. Imagine that you select lemon layer cake.”

Participants were then told either that the other person ordered berry cheesecake bites (matching on healthiness condition) or that the other person ordered mixed berries (mismatching on healthiness condition). Both options are easy-to-share, as they come in bite-sized pieces.
Participants in the offering to share group were told that the other person offered to share some of their order by saying, “Feel free to have some of my cheesecake (matching on healthiness condition) / berries (mismatching on healthiness condition) if you want some variety.”

As in Study 4, participants were then asked how much they would like the other person (“I would like this person”; 1 = not at all, 9 = very much).

Results and Discussion

Results. A 2 (matching on healthiness, mismatching on healthiness) × 2 (offering to share: no, yes) AVOVA was conducted on the affiliation measure. There was no significant interaction (F(1, 396) = .95, p = .330). Instead, there was a significant main effect of offering to share (F(1, 396) = 32.13, p < .001), such that offering to share led to being liked more than not offering to share (M = 6.73 vs. M = 5.93), and a marginally significant main effect of matching (F(1, 396) = 3.62, p = .058), such that matching on healthiness led to being liked more than not matching on healthiness (M = 6.46 vs. M = 6.20). See Figure 7.

FIGURE 7

STUDY 5: AFFILIATION AS A FUNCTION OF WHETHER RESPONDING CONSUMER CHOOSES AN UNHEALTHY OPTION AND OFFERS TO SHARE
We then conducted the two focal planned contrasts. Contrast 1 revealed that choosing an unhealthy option and not offering to share led to being liked more than choosing a healthy option and not offering to share ($M = 6.13$ vs. $M = 5.73$; $F(1, 396) = 4.08, p = .044$), replicating Study 4. Contrast 2 revealed that choosing an unhealthy option and not offering to share led to being liked less than choosing a healthy option and offering to share ($M = 6.13$ vs. $M = 6.66$; $F(1, 396) = 7.06, p = .008$). This contrast indicates that offering to share for variety’s sake decreases the conflict between healthy eating and affiliation with an indulging consumer. Finally, we conducted a third contrast to compare the affiliation consequences of choosing and offering to share an unhealthy option versus choosing and offering to share a healthy option. Unlike contrast 2, contrast 3 was not focal because it did not directly test the effectiveness of the sharing strategy. However, contrast 3 did reveal that choosing an unhealthy option and offering to share led to a similar level of being liked as choosing a healthy option and offering to share ($M = 6.79$ vs. $M = 6.66$; $F(1, 396) = .44, p = .509$).

Discussion. Study 5 demonstrates that offering to share for variety’s sake is effective at decreasing the conflict between healthy eating and affiliation with an indulging consumer. Indeed, in this study, choosing a healthy option and offering to share it for variety’s sake actually led to greater affiliation than choosing an unhealthy option without offering to share it.

**STUDY 6: ATTRIBUTING HEALTHY EATING TO A HEALTH ISSUE**

Study 6 tests another potential strategy for decreasing the conflict between healthy eating and affiliation with an indulging consumer. Specifically, Study 6 tests whether making a healthy food choice, but attributing it to a health issue, can lead to as much affiliation as making an
unhealthy food choice. Of course, only people with a diet-restricting health issue (e.g., diabetes) can use this strategy. However, given that such consumers likely face more repercussions from unhealthy eating, strategies that can allow them to simultaneously engage in healthy eating and affiliation may be particularly important (Ma, Ailawadi, and Grewal 2013).

To test our hypothesis, Study 6 manipulates both a) whether a responding consumer makes a healthy or unhealthy choice and b) whether a responding consumer mentions having a health issue that would make the healthy choice appropriate. There are three focal contrasts, which test for replication of the conflict between healthy eating and affiliation with an indulging consumer (contrast 1) and test whether mentioning a health issue decreases this conflict (contrasts 2 and 3). First, if a responding consumer does not mention a health issue, we expect affiliation to be higher if the consumer makes an unhealthy versus a healthy choice, replicating Study 4 and the two non-sharing conditions in Study 5. Second, we expect affiliation to be at least as high in the healthy choice with health issue condition as in the unhealthy choice with no health issue condition. Third, if a responding consumer mentions a health issue, we expect affiliation to be at least as high if the consumer makes a healthy choice as if she makes an unhealthy choice. If consumers dislike those who neglect their health issues, affiliation might even be higher when the responding consumer makes a healthy rather than unhealthy choice.

Method

**Participants and design.** Two hundred participants (38.5% female; $M_{\text{age}} = 33.59$) recruited from MTurk completed this study, which had a 2 (matching on healthiness, mismatching on healthiness) × 2 (health status: control, diabetes) group between-subjects design.
Procedure. All participants read the following scenario, which was similar to Study 5’s scenario: “Imagine that you and another person are at a small café in the afternoon. This is your first time meeting this person. An acquaintance of yours was supposed to take this person, a distant cousin, to get ice cream but had to work at the last minute and asked you to take this person to get ice cream instead. You both look at the dessert display. Imagine that you select a bowl of full-fat chocolate ice cream. The remaining options are full-fat vanilla ice cream and light (low-fat, reduced sugar) vanilla ice cream.”

Participants in the control group were told either that the other person ordered full-fat vanilla ice cream (matching on healthiness) or that the other person ordered light (low-fat, reduced-sugar) vanilla ice cream. Participants in the diabetes and matching on healthiness group were told that the other person ordered full-fat vanilla ice cream and mentioned, “I’ll get this one…even though it’s worse for my diabetes.” Participants in the diabetes and mismatching on healthiness group were told that the other person ordered light (low-fat, reduced-sugar) vanilla ice cream and mentioned, “I’ll get this one…it’s better for my diabetes.” All participants in the diabetes group were told that the other person had Type I diabetes, described as “caused by a combination of genetics and an autoimmune response.” The other person was described as having Type I diabetes to avoid a potential main effect of liking someone with Type II diabetes less (Browne et al. 2013; Teixeira and Budd 2010).

As in Studies 4 and 5, participants then indicated how much they would like the other person (“I would like this person”; 1 = not at all, 9 = very much).

Results and Discussion
**Results.** A 2 (matching on healthiness, mismatching on healthiness) × 2 (health status: control, diabetes) AVOVA on affiliation revealed a significant interaction \( F(1, 196) = 17.24, p < .001 \). See Figure 8.

**FIGURE 8**

STUDY 6: AFFILIATION AS A FUNCTION OF WHETHER RESPONDING CONSUMER CHOOSES AN UNHEALTHY OPTION AND MENTIONS HEALTH ISSUE

![Graph showing preference scores for different conditions](image)

We then conducted three planned contrasts. Contrast 1 replicated Study 4 and the two non-sharing conditions in Study 5, showing that when the responding consumer did not mention a health issue, participants liked the responding consumer more if the responding consumer chose an unhealthy \( (M = 6.12) \) versus a healthy option \( (M = 5.56; F(1, 196) = 4.38, p = .038) \). Contrast 2 showed that choosing a healthy option and mentioning a health issue led to being liked as much as choosing the unhealthy option and not mentioning a health issue \( (F(1, 196) = .20, p = .653) \). Finally, contrast 3 showed that when the responding consumer mentioned a health issue, participants liked the responding consumer less when the responding consumer chose an unhealthy \( (M = 5.24) \) versus a healthy option \( (M = 6.24; F(1, 196) = 14.36, p < .001) \).

**Discussion.** Study 6 demonstrates another way to decrease the conflict between healthy eating and affiliation with an indulging consumer: attribute the healthy eating to a health issue
that would make the healthy choice the appropriate selection. Indeed, choosing a healthy option and attributing it to a health issue led to as much affiliation as choosing an unhealthy option and not attributing it to a health issue (second contrast) and led to more affiliation than choosing an unhealthy option and mentioning a health issue (third contrast). This latter finding is noteworthy because it runs counter to most findings on the affiliation benefits of matching (Hove and Risen 2009; Lakin and Chartrand 2003; Lowe and Haws 2014).

**GENERAL DISCUSSION**

People care strongly about affiliating with and being liked by other people. In the present research, we examined situations with a dyad making sequential food choices, wherein the first consumer to order (“the indulging consumer”) chose an unhealthy option and the second consumer to order (“the responding consumer”) chose either an unhealthy option and or a healthy option. Because healthiness is an attribute conveying considerable social meaning (Oakes and Slotterback 2004; Rozin 1996), we proposed that for a responding consumer, choosing a healthy option conflicts with affiliating with an indulging consumer. Eight studies established that this conflict exists, from both the responding and indulging consumer perspectives. Importantly, we also found that consumers can engage in strategies to decrease this conflict, such that healthy eating can be compatible with being liked by an indulging consumer.

Studies 1 to 3 focused on the responding consumer’s perspective. Study 1 showed that people believe matching on healthiness is better for affiliating with an indulging consumer than mismatching on healthiness. Moreover, people did not believe that all attributes were similarly critical for affiliation: they believed that matching the indulging consumer on healthiness would
matter more for affiliation than matching on flavor. Building on these findings, Studies 2a to 2c examined the consequences of these beliefs for food choices, showing that an affiliation goal can increase choice of an unhealthy option. Study 2a also showed that not all matches are created equal; consumers with an affiliation goal chose an unhealthy option that mismatched on flavor over a healthy option that matched on flavor. However, consistent with the notion that people affiliate by trying to match on socially meaningful attributes, consumers did match on flavor when it was a socially meaningful attribute (Study 3). In sum, Studies 1 to 3 showed that responding consumers believe that a conflict exists between healthy eating and affiliation with an indulging consumer and, accordingly, an affiliation goal increased choice of unhealthy food.

Studies 4 to 6 focused on the indulging consumer’s perspective. Study 4 showed that indulging consumers do feel more affiliated with a responding consumer who chooses an unhealthy rather than a healthy option. Importantly, however, responding consumers can choose a healthy option without decreasing affiliation if they either offer to share the healthy food for variety’s sake (Study 5) or if they attribute the healthy food to a health issue (Study 6).

Across all studies, we focused on a dyadic context in which the first consumer to order chose an unhealthy option. We focused on this context because a conflict between healthy eating and affiliation is unlikely to arise if the first person chooses a healthy option. Indeed, in a follow-up study (details available from the authors), we found that the effect identified in Study 2a (goal to affiliate leads to choice of an unhealthy option) does not occur when the first person chooses a healthy option. Specifically, when the first consumer chooses a healthy option, then a goal to affiliate with the first consumer did not lead to increased choice of an unhealthy option by the second consumer. This finding shows that when a dining companion has chosen a healthy option, then the means of addressing a healthy eating goal are compatible with the means of addressing
an affiliation goal; thus, an affiliation goal will not increase choice of an unhealthy option.

Theoretical Contributions

This research offers several theoretical contributions. First, whereas prior research on conflict between healthy eating and a pleasurable eating experience has typically focused on conflict between healthy eating and a food-derived source of pleasure—taste (Dhar and Simonson 1999; Etkin et al. 2015; Fishbach et al. 2003; Laran 2010; Liu et al. 2015; Raghunathan et al. 2006; Shiv and Fedorikhin 1999; Stroebe et al. 2013), the current research focuses on the understudied conflict between healthy eating and a socially-derived source of pleasure—affiliating with or being liked by fellow consumers—from both indulging and responding consumer perspectives. Indeed, although some prior research has examined the indulging consumer’s perspective and shown that people like others more if others make a more unhealthy food choice than they do as opposed to if they make a healthier food choice (Leone et al. 2008), the only prior research that we are aware of which examines the responding consumer’s perspective is correlational, showing that people high in sociotropy report engaging in more unhealthy eating to match a dining companion (Exline et al. 2012). Thus, our research is the first that we are aware of to provide causal evidence that a goal to affiliate with an indulging consumer can lead to more unhealthy choice.

Second, past literature shows that an affiliation goal leads people to engage in similar behaviors and to express similar product preferences as consumers they want to affiliate with (Exline et al. 2012; Lakin and Chartrand 2003; Mead et al. 2011). However, to our knowledge, past research has not examined whether people believe similarity along some attributes matters
more for affiliation than similarity along other attributes. This research is thus the first that we are aware of to show that an affiliation goal leads people to prioritize matching on one attribute over another. Specifically, we found that people believe matching on healthiness, a socially meaningful attribute that impacts social judgments (Oakes and Slotterback 2004; Rozin 1996), matters more for affiliation in most situations than matching on flavor, an attribute that typically conveys little social meaning (Studies 1 to 3).

Third and finally, past research suggests that similarity in behaviors promotes affiliation more than dissimilarity (Chartrand and Bargh 1999; Hove and Risen 2009) and, of particular relevance to the present context, that matching an indulging consumer on healthiness will lead to greater affiliation than mismatching (Leone et al. 2008; Lowe and Haws 2014). Study 4 confirms that matching an indulging consumer on healthiness indeed leads to greater affiliation than mismatching. Studies 5 and 6 are the first that we are aware of to show that mismatching on healthiness can lead to as much or greater affiliation than matching by identifying two strategies resulting in such an effect. Indeed, other than the finding that consumers high in need for uniqueness react negatively when matched on a symbolic product dimension (White and Argo 2011), these studies are the first that we are aware of to show that mismatching product choices can lead to greater affiliation than matching ones.

Practical Implications

The present research offers several practical implications for consumers and other parties interested in promoting healthy eating. First, many consumers may want to eat healthier without decreasing affiliation with an indulging dining companion (Macdiarmid et al. 2013).
research offers two strategies for such consumers (offering to share one’s healthy selection for variety’s sake or attributing the choice of a healthy option to a health issue for which eating healthy food is recommended). Our research shows both strategies to be effective at decreasing the conflict between healthy eating and affiliating with an indulging companion.

Second, many parties that are interested in promoting healthy eating (e.g., doctors, nutritionists, policymakers, and some food industry members) should be aware of social barriers that increase unhealthy food choice or make healthy food choice more difficult. They should then address these barriers when providing advice or designing menu items, policies, and advertising aimed at promoting healthy eating. For instance, doctors and nutritionists coaching obese patients may ask them if they often have indulging dining companions and if so, equip patients with strategies (e.g., offering to share for variety’s sake) for choosing healthier foods without decreasing affiliation with these companions. As another example, many food retailers are seeking ways to promote healthier options (Wansink 2012). To help make healthy eating compatible with fitting in socially, these firms might offer easily shareable healthy options and encourage customers to share healthy food through promotions highlighting the variety in flavors that sharing can provide.

Limitations and Future Directions

These implications, and the limitations in this research, offer multiple directions for future research. First, while this research focused on affiliation in food contexts, given that many consumers report facing social barriers to healthy eating (Macdiarmid et al. 2013), future research may examine whether these findings extend to other self-control domains. For instance,
does saving money conflict with affiliating with a high-spending consumer and, if so, what strategies can be used to decrease this conflict?

Second, we focused on healthiness and flavor as examples of attributes that vary in terms of how socially meaningful they typically are. Our rationale for focusing on healthiness is clear, given our focus on identifying and overcoming social barriers to healthy eating, and we also focused on flavor, as it is another prominent feature of foods (Inman 2001). However, foods differ on other attributes besides healthiness and flavor. Future research may thus examine to what extent matching on other attributes is important for affiliation. Future research may also delve further into examining what factors make an attribute more or less important for social judgment. For instance, one factor might be whether an attribute tends to foster vertical social comparisons (am I better or worse than you on this attribute) or horizontal social comparisons (how similar or different are we on this attribute; Locke 2005). Perhaps vertical social comparisons are especially uncomfortable to highlight in a social setting, such that attributes facilitating such comparisons are more important to match on for affiliation. In contrast, attributes facilitating horizontal social comparisons may be more variable in their importance for matching on for affiliation. In some cases, consumers may prefer similarity for affiliation (e.g., to signal solidarity on an important group identity dimension); in other cases, consumers may prefer differentiation (e.g., to signal uniqueness), and in yet other cases, consumers may not care about similarity or differences (e.g., the notion of to each her own tastes).

Third, this research showed that indulging consumers feel self-conscious when mismatched on healthiness (Study 4). However, the emotions literature distinguishes between different negative self-conscious emotions (shame, guilt, embarrassment, and social anxiety; Leary (2007)). Future research might try to identify which specific emotion operates when
people are mismatched on healthiness and to test whether experiencing different self-conscious emotions has consequences for affiliation. Additionally, our research focused on the motive to avoid making the indulging consumer feel self-conscious (Studies 1 and 3) and the indulging consumer feeling self-conscious (Study 4) as mediators. However, other mediators might also be at play. For instance, perceptions of the responding consumer may also be involved (e.g., matching on healthiness may be driven both by the motive to avoid making an indulging consumer feel self-conscious and by the motive to be perceived as easygoing).

Finally, the last two studies were designed with the practical aim of testing the effectiveness of two strategies for decreasing the conflict between healthy eating and affiliation with an indulging consumer. A limitation of these studies, however, is that they did not test why these strategies were effective and the boundary conditions for their effectiveness. For instance, in terms of boundary conditions for the strategy of offering to share for variety’s sake, does this strategy increase affiliation regardless of whether the indulging consumer accepts the offer? Or, might the offer to share lead some indulging consumers to reciprocate by offering to share their unhealthy option? If so, would a responding consumer need to accept the reciprocated sharing offer to affiliate? Additionally, in terms of boundary conditions for the strategy of attributing a healthy food choice to a diet-restricting health issue, does this strategy work for non-health-related diet-restrictions (e.g., religious diet restrictions) and health issues that are sometimes perceived to be a consumer’s fault (e.g., Type II diabetes)? Future research may examine these questions and also test the effectiveness of other strategies for choosing healthy food without decreasing affiliation with indulging consumers.
REFERENCES


Browne, Jessica L., Adriana Ventura, Kylie Mosely, and Jane Speight (2013), “‘I Call it the Blame and Shame Disease’: A Qualitative Study About Perceptions of Social Stigma Surrounding Type 2 Diabetes,” *BMJ Open*, 3 (11), e003384.


Personality and Social Psychology, 84 (February), 296-309.


Macdiarmid, Jennie I., Jennifer Loe, Janet Kyle, and Geraldine McNeill (2013), “‘It was an Education in Portion Size.’ Experience of Eating a Healthy Diet and Barriers to Long Term Dietary Change,” *Appetite*, 71 (December), 411-9.


Stroebe, Wolfgang, Guido M. van Koningsbruggen, Esther K. Papies, and Henk Aarts (2013),

*Psychological Review*, 120 (January), 110-38.


