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Consumer Strategies to Improve the Efficacy of Posted Calorie Information: How Provincial Norms Nudge Consumers to Healthier Consumption

Seeking to help consumers make healthier decisions, the U.S. Food and Drug Administration (FDA) mandated in 2010 the direct posting of calorie information on menus. Research, however, consistently demonstrates this mandate to not be as effective as intended despite required compliance in 2018. In response, the present research proposes a social marketing technique that leverages *provincial norms* (i.e., norms that are specific to consumption contexts) to nudge consumers toward healthier decisions. Across one field and two laboratory experiments, exposure to low-calorie provincial norms consistently reduced calorie totals (relative to both a descriptive and no-norm control condition). This reduced calorie total stemmed from a heightened motivation to align with the norm and did not undermine satisfaction, facilitate overindulgence on subsequent choices, or heighten guilt. Collectively, these findings offer an important means of increasing the efficacy of the FDA mandate while providing unique insight into how provincial norms nudge consumers toward healthier decision making.

Obesity is a national epidemic (Centers for Disease Control and Prevention; CDC 2011). Nearly two in five American adults are categorized as obese and the obesity rate has climbed 9.1% from 2000 to 2016 (McCarthy 2017). These statistics reflect not only the adverse health consequences for those living with obesity (e.g., heightened risks for diseases, lower life expectancies: see Flegal et al. 2012), but also the adverse financial consequences to the economy, with the CDC estimating obesity-related medical care costs at around $150 billion annually (CDC 2015). Given the high rates

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of obesity in America and the high percentage of food and beverage consumption that occurs outside the home (Krieger and Saelens 2013), the U.S. Food and Drug Administration (FDA) has strategically sought to combat this epidemic by focusing on the provision of nutrition information for consumers (Institute of Medicine 2012; Koplan, Liverman, and Kraak 2005). In particular, the FDA mandated directly posting calorie information on menus. With the mandate going live in May of 2018, all restaurants, movie theaters, convenience stores, and vending machines with 20 or more outlets are required to post calorie counts for each item directly on the menu in accord with the Patient Protection and Affordable Care Act of 2010.

The policy rationale is posting calorie information should help consumers make healthier consumption decisions (Burton et al. 2006; Kuo et al. 2009), given they tend to underestimate calories and overconsume in the absence of this information (Tangari et al. 2010). Yet prevailing evidence regarding policy efficacy—that is, the posting of calorie information as a means of reducing caloric intake—is the mandate may not be as effective as intended (Bollinger, Leslie, and Sorensen 2011; Harnack and French 2008; Kiszko et al. 2014; Long et al. 2015; Swartz, Braxton, and Viera 2011; VanEpps et al. 2016b; VanEpps, Downs, and Loewenstein 2016a). Meta-analyses and review papers find the lack of effectiveness stems from consumers failing to assimilate or account for calorie information into consumption choices. These findings help explain recent calls for research to combat unhealthy eating (Frederick, Snellman, and Putnam 2014; NIH 2018) while posing a dilemma for policymakers regarding the efficacy of this mandate—specifically, what can be done to help consumers incorporate calorie information into their decisions?

In response, the present research focuses on the use of a social marketing technique that leverages *provincial norms*. Provincial norms highlight the behavior of individuals in a precise setting or environment (Goldstein, Cialdini, and Griskevicius 2008; Schultz et al. 2007). Provincial norms are *more specific* than descriptive norms that highlight the behavior of others in broad (i.e., less specific) contexts. A descriptive norm may provide general information to restaurant diners regarding tips (e.g., patrons in general tip 22%). Provincial norms would provide that information to restaurant diners in their specific context (e.g., patrons of this restaurant tip 22%).

Given provincial norms highlight expected behavior in a specific context, we contend that exposing consumers to low-calorie provincial norms should *increase* healthier consumption (i.e., a reduction in calories ordered) in contexts where healthy eating is non-normative (e.g., indulgent settings). The specificity of provincial norms provides a *relevant* prototype for how consumers behave in an applicable context thereby increasing motivation

to align with the norm (Jensen, Vaish, and Schmidt 2014; see Hogg 2016). Because of this heightened motivation, exposure to a low-calorie provincial norm should decrease the total number of calories consumers order.

In sum, we posit that exposure to provincial norms will prompt consumers to make healthier consumption decisions. We hypothesize that this effect is due to an increased motivation to align with specific contextual norms. We first review research relevant to our predictions followed by three experiments testing our hypotheses. Specifically, we demonstrate in a field experiment conducted at a Cinnabon store that low-calorie provincial norms are the most effective in reducing calories ordered. In two follow-up lab studies, we demonstrate that this reduction comes as a result of a heightened motivation to align with the provincial norm (Experiments 2 and 3) and that this reduction does not lead consumers to overcompensate for the low-calorie choice by adding more calories in subsequent choices (i.e., an initial healthy choice leading to a subsequent unhealthier choice) (Experiment 3). We conclude with a discussion of implications of this research for practice and theory.

CONCEPTUAL BACKGROUND

Norms have been deemed one of the most powerful forms of influence (Bearden and Etzel 1982; Cialdini 1993; Hechter and Opp 2001; Prentice and Miller 1993). As norms highlight the behavior of others they serve as cues indicating what is expected or effective for consumers (see Cialdini, Kallgren, and Reno 1991). For instance, entering a parking structure and noticing the ground covered with litter provides information that littering is accepted—if not expected—in the parking garage (Cialdini, Reno, and Kallgren 1990). In this way, then, norms detail important information about prototypical behavior that facilitates social learning (Bandura 1977).

Not all norms that describe the behavior of others have equal influence (Cialdini, Kallgren, and Reno 1991; Cialdini, Reno, and Kallgren 1990; Goldstein, Cialdini, and Griskevicius 2008). Researchers make a distinction between norms that describe behavior in general (i.e., descriptive norms) versus behavior in specific contexts (i.e., provincial norms). Descriptive norms describe how people act in general (Cialdini, Kallgren, and Reno 1991; Goldstein, Cialdini, and Griskevicius 2008). For instance, Goldstein, Cialdini, and Griskevicius (2008) investigated the extent to which towel reuse rates could be altered during hotel stays to see if guests would be more likely to reuse towels (vs. replacing used towels with new towels). When hotel guests were presented with a descriptive norm about

reusage rates of guests who stayed in the same hotel, it positively influenced reuse rates compared to standard environmental appeals.

Provincial norms, on the other hand, describe how people act in a specific context or situation (Agerström et al. 2016; Goldstein, Cialdini, and Griskevicius 2008; Payne et al. 2015; Reese, Loew, and Steffgen 2014; Schultz et al. 2007). In the same experiment on hotel towel reuse, Goldstein and colleagues included a condition in which they told hotel guests about reuse rates of guests who stayed *in the same room* (i.e., provincial norm) and found an increase in reuse rates compared to those who were told about guests who stayed in the same hotel (i.e., descriptive norm).
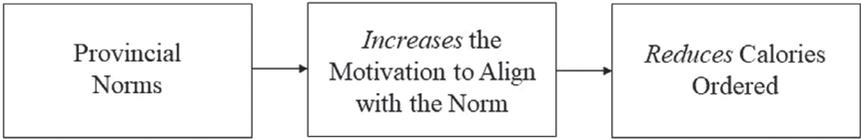
Notably, in the Goldstein, Cialdini, and Griskevicius (2008) paper, when participants were presented with the same normative information (i.e., reuse rates); only the specificity of the norm was altered (see also Agerström et al. 2016). This finding begets the question of why specificity increases the efficacy of provincial (relative to descriptive) norms. While researchers have speculated on explanations (e.g., generalized learning or a rare shared experience; Goldstein, Cialdini, and Griskevicius 2008), we propose provincial norms heighten motivation to align with the norm due to relevancy of the information to the choice. Provincial norms describe the behavior of others in the same context as the consumer. This relevance provides a powerful prototype for consumers. Social identity research demonstrates that consumers are motivated to assimilate toward such prototypes (for a review, see Hogg 2016), making provincial norms more pertinent to consumers than descriptive norms (for a similar argument, see Bohner and Schlüter 2014). To increase the efficacy of calorie information, we propose provincial norms will successfully nudge consumers toward healthier decisions by increasing motivation to align calorie orders with the provided provincial norm.

PREDICTIONS

This research aims to improve the effectiveness of posted calorie information to promote healthier consumption behavior by strategically using provincial norms to improve the efficacy of the current FDA mandate. Specifically, we test the possibility that exposure to provincial norms can reduce the total calories desired by the consumer. As is outlined in our conceptual model (see Figure 1), we predict that:

> H1: Provincial norms will reduce the number of total calories ordered compared to the descriptive norm and no-norm (i.e., control) conditions.

FIGURE 1
Conceptual Model

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┌──────────────┐     ┌──────────────────┐     ┌──────────────────┐
│              │     │  Increases the   │     │                  │
│  Provincial  │ ──▶ │ Motivation to Align │ ──▶ │ Reduces Calories │
│    Norms     │     │  with the Norm   │     │     Ordered      │
│              │     │                  │     │                  │
└──────────────┘     └──────────────────┘     └──────────────────┘
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Further, we contend that provincial norms will reduce the number of calories desired by directly increasing motivation to align calorie orders with the provincial norm. Formally, we predict that:

H2: Provincial norms will reduce the number of calories ordered as a result of heightening consumers' motivation to align their behavior with the norm compared to the descriptive norm and no-norm (i.e., control) conditions.

Finally, central to the concept of provincial norms is the notion that the norm must be specific to the context to successfully alter behavior (Goldstein, Cialdini, and Griskevicius 2008). We posit that provincial norms will not alter other, unrelated food choices. Thus:

H3: Provincial norms will not impact the calories ordered in contexts unrelated to the norm.

STUDY OVERVIEW

The goal of this research is to test the proposition that exposing consumers to low-calorie provincial norms increases healthier consumption by heightening consumer motivation to align with provincial norms. In so doing, we followed prior research procedures regarding the testing of provincial norms by comparing the effects of provincial norms on reduced total calories relative to a no-norm (i.e., control) condition (Goldstein, Cialdini, and Griskevicius 2008). Further, to ensure the effects are specific to provincial norms, we included a descriptive norm condition (see Agerström et al. 2016).

Across all three conditions (provincial norm, descriptive norm, and control), the stimuli adhered to the current mandate requiring itemized calorie information by exposing participants across studies to a menu containing individualized calorie information for each item. Those in the *provincial* and *descriptive* norm conditions were presented with additional, normative information regarding the average calories consumers order; specifically, the *provincial norm* condition presented participants with a low-calorie norm specific to the immediate context

(i.e., for consumers of that particular restaurant), whereas the *descriptive norm* condition presented participants with the same low-calorie norm but not specific to the immediate context (i.e., for consumers of the restaurant chain in general). The control condition contained only the FDA required itemized calorie content with no normative information.

We focus on the role of calorie information in indulgent contexts to provide a strong, relevant, and practical test of our hypotheses. Consumers are likely to find it more difficult to make healthier decisions in indulgent contexts and thus account less for calorie information. For instance, past work has examined the use of nutrition information in fast food choices for children (Stutts et al. 2011) and adults (Droms 2016), finding that taste and preference determine choice rather than nutrition information. Burton et al. (2014) find calorie information in chain restaurants influences the choices of high health risk individuals, but not other consumers. Furthermore, Berry, Burton, and Howlett (2018) find perceptions of restaurants as less healthful attenuate any helpful benefits of calorie information on attitudes and intentions regarding the restaurant when forced to follow the calorie posting mandate. Given the need to influence consumption behavior in settings where consumers have a priori decided to indulge, there is a true opportunity to nudge consumers toward healthier consumption.

Furthermore, our studies in the context of indulgent consumption speak directly to the role of unhealthy food contributing to the obesity epidemic (see Murray et al. 2014). Desserts represent empty calories and added sugars targeted by the USDA in developing dietary guidelines. As a category, desserts and sweet snacks produce the second most calories as a percentage of total energy consumption in America, behind only the category including burgers, sandwiches, and tacos (USDA 2015). The USDA advisory committee report (2015) recommends finding ways to reduce intake and potentially taxing desserts and sweet snacks to decrease dietary intake. Our research may provide a less heavy-handed approach to curbing intake of empty calories.

Our thesis was tested across three experiments. We tested our primary hypothesis that provincial norms reduce total calories ordered in a field study at a New York City Cinnabon store. We then conducted two laboratory experiments to: (1) reinforce the findings of the field study, (2) directly test our proposed mechanism (i.e., motivation to align with the norm) in a more controlled environment, and (3) address the possibility of overcompensation effects for subsequent choice.

EXPERIMENT 1

Our initial experiment—a field study—tested our primary hypothesis that provincial norms reduce the total calories purchased at a Cinnabon retail outlet in New York City. At the time of the experiment, the mandate requiring the posting of calorie information had been implemented in New York City. Cinnabon was selected given its positioning as a retailer serving high-calorie snacks (e.g., cinnamon rolls). Indeed, consumers typically patronize Cinnabon for indulgent snacks not part of normal routines.[1] Our goal was to explore the possibility that provincial norms could decrease the total calories ordered in consumption contexts that should be most *resistant* to posted calorie information (i.e., indulgences).

The field experiment allowed for measuring actual calories purchased in aggregate form for the entire order. Indeed, Cinnabon's menu has a wide range of options with calories ranging from 0 (e.g., bottled water) to 1,080 (e.g., a Pecanbon). Furthermore, the field study took place near a major transit area, which allowed us to test our predictions amongst a broad range of consumers, including local commuters and out-of-town visitors to New York City.

METHOD

Participants and Design

Two hundred Cinnabon customers were intercepted during a 4-day period (Friday to Monday) at a train station (Penn Station) in New York City from 11 A.M. to 7 P.M. We recruited participants already in line to make a purchase at Cinnabon with an offer for a $5 gift card. The gift card was not valid for the current purchase but was good on a future purchase to mitigate any potential effects resulting from an increase in immediate disposable income (i.e., *windfall effects*; Arkes et al. 1994).

Of the 200 customer participants, 34 were excluded for either purchasing items in bulk ($N = 21$) or not completing the survey ($N = 13$).

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1. We ran a pretest to confirm our assumption that consumers typically patronize Cinnabon for high-calorie snacks not part of their normal routine. Adult participants ($N = 56$) were asked the extent to which they agreed with the following statement: "If I visited a Cinnabon store it would be to get a treat," on a scale anchored at 1—*Somewhat agree* to 7—*Completely agree*. Of these, 80% agreed (5 or greater) with this statement ($M = 5.33$, $SD = 1.57$). Similarly, we asked participants about normal patronage habits: "If I visited a Cinnabon store it would be an exception rather than the rule" on the same scale anchor. Again, 80% of participants agreed with the statement ($M = 5.88$, $SD = 1.49$).

The final sample, therefore, consisted of 166 participants (50% Female; $M_{age} = 39.82$) randomly assigned to one of three conditions: a provincial norm condition, a descriptive norm condition, or a no-norm (i.e., control) condition.

Procedure

Two research assistants blind to the intent of the experiment reached out to patrons waiting in line at Cinnabon. Following a brief introduction and explanation regarding the compensation for the study, the research assistants informed participants that Cinnabon was trying to better understand customers and wanted to get their opinions on potential messages to be used in future advertisements (the latter half was excluded for those in the control condition).

The research assistants then presented the participant with a message and instructed the participant to view the new Cinnabon advertisement. In the *provincial norm* condition, participants saw a message that read: "People at this store in this part of the city will order items with 250 calories on average." In the *descriptive norm* condition, participants saw a message that read: "People at other stores in other states across the country will order items with 250 calories on average." In the *control* condition, participants were not presented with a message. This manipulation was adapted from prior research (see Goldstein, Cialdini, and Griskevicius 2008).[2]

Of note, we elected to use 250 cal given the prevalence of fast-food restaurants that promote healthier meal and snack items as having "under 300 calories." After receiving the message, participants were then instructed to answer questions consistent with the cover story.[3] Following this, participants were told to make their purchases. Importantly, all calorie information was printed on Cinnabon's menu alongside the corresponding

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2. We conducted a manipulation check to confirm the intended manipulation of the norm's manipulation (i.e., provincial vs. descriptive). Specifically, we measured participants' agreement with the following statement, "The ad I saw was about people at this store in this part of the city." Results of the manipulation check confirmed that participants in the provincial norm condition agreed that the ad was specific to the immediate surroundings ($M = 5.14$; $SD = 2.38$), more so than did those in the descriptive norm condition ($M = 2.48$; $SD = 2.53$ [$t(113) = -5.80$, $p < .001$]).

3. Consistent with the cover story, participants exposed to an ad (provincial and descriptive norm conditions) were asked to indicate the extent to which they liked the ad ("Did you like the ad?") on a scale anchored at 1—*Dislike* to 10—*Like*. Those in the control condition were not asked whether they liked the ad. As expected, there was no significant difference in the liking of the advertisements between those in the provincial ($M = 6.27$, $SD = 6.65$) and descriptive ($M = 6.02$, $SD = 6.69$) norm conditions ($p > .61$).

FIGURE 2
Average Calories Ordered by Condition in Experiment 1

Total Calories Ordered
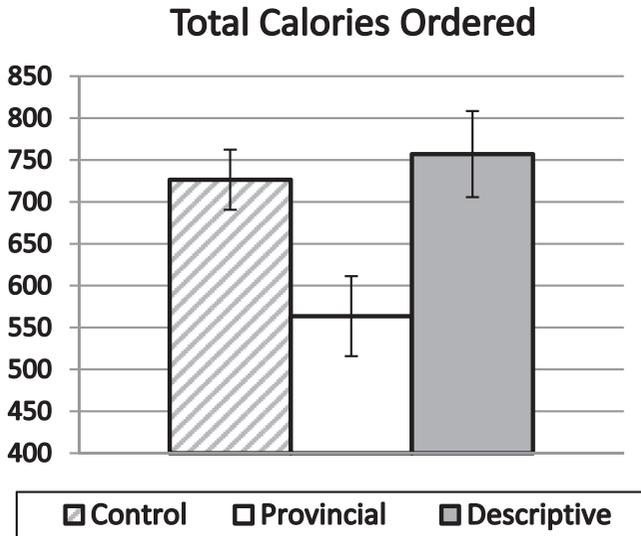
item. After making their purchase, participants brought their receipts back to the research assistant.

After returning their receipts, each participant completed a series of follow-up questions[4] and demographic questions and was given the $5 gift card. All receipts were then stapled to the corresponding survey to appropriately calculate and record the calories purchased.

RESULTS

The total number of calories purchased was submitted to a one-way analysis of variance (ANOVA), with condition as the independent variable. The analysis revealed a significant effect of condition on the number calories purchased, $F(2,163) = 5.27, p = .006$; see Figure 2. Planned comparisons revealed that the provincial norm reduced calories purchased relative to the control ($p = .037$) and descriptive norm ($p = .008$) conditions,

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4. For exploratory purposes we asked participants two questions concerning their frequency visiting the store: "In general, I visit this Cinnabon store when I want to get a snack" and "In general, I pass in front of this store" on scales anchored at 1—*Never* to 7—*Daily*. Neither question interacted with the norm condition to influence the total calories ordered by consumers ($ps > .36$), suggesting provincial norms reduce calories ordered regardless of consumer patronage.

with no difference between the descriptive norm and control conditions ($p > .88$).

DISCUSSION

The findings of the field study offer initial yet robust evidence to support Hypothesis 1, that provincial norms increase the efficacy of calorie information in reducing total calories purchased by consumers. This finding is intriguing given that visiting Cinnabon represents a context likely to elicit implicit resistance to healthier consumption. However, by presenting consumers with provincial norms, consumption behavior was significantly altered—here, by the number of calories purchased.

These findings address an important possible explanation for the effect of norms on calories purchased—namely, that the presented calorie values prime consumers with a low anchor. Anchoring means that numeric information in one context can influence judgments in a separate context (Tversky and Kahneman 1974). An anchoring explanation would predict consumers would use any number presented in the Cinnabon context, even if the number was unrelated to a norm (e.g., "Did you know that 250 people come into the store every hour?"). However, the findings here do not support an anchoring explanation, given that: (1) the descriptive norm condition did not significantly vary from the control condition in which no number was presented, and (2) those in the provincial norm condition purchased fewer calories than the descriptive norm condition despite both norm conditions presenting participants with the same number. One likely explanation for this lack of anchoring on the calorie value is that these consumers were familiar with Cinnabon, and familiarity can significantly attenuate anchoring effects (Wilson et al. 1996). Consequently, these findings appear to be unique to the calorie value as part of a provincial norm.

Finally, one could argue the descriptive norm used in this study may be perceived as representing an outgroup. Less clear is whether consumers would view general information (i.e., descriptive norms) as more representative of a particular group (e.g., an outgroup) rather than representative of group behavior more broadly. Accordingly, we clarified the norm descriptions in the subsequent experiment.

EXPERIMENT 2

The purpose of Experiment 2 was to replicate the findings of the field study and offer insight into the mechanism underlying the effect. We posit that provincial norms motivate consumers to align with the norm.

If provincial norms motivate responses aligned with the norm, we should observe consumers more accurately recollecting norm-specific information (i.e., calorie values). Thus, we posit that consumers will be more accurate in recalling calorie information—here, the total calories ordered—in the provincial norm condition.

Additionally, Experiment 2 sought to explore the implications of provincial norms for satisfaction. Though we propose provincial norms benefit healthier decision making, do these decisions come at the expense of satisfaction? One could argue consumers indulge less but are less satisfied. Alternatively, one could argue that consumers choosing to indulge in a healthier way, having willfully decided, should be no more or less satisfied with the choice (see Block et al. 2011). We directly tested if decreased calorie consumption influenced satisfaction.

Given that the norms used in Experiment 1 could have been confounded with in-group (e.g., consumers at this location) and out-group (e.g., consumers at other locations) affiliation, we explicitly altered the specificity of the norms to be specific to the context (e.g., customers at a particular location) or non-specific to the context (e.g., customers worldwide).

METHOD

Participants and Design

Sixty undergraduate participants (70% Male; $M_{age} = 20.23$) participated in a study on food consumption. Participants were randomly assigned to one of three conditions: a provincial norm condition, a descriptive norm condition, or a control condition. For this experiment, we selected a numeric norm similar to a one-cup serving of other types of desserts (e.g., ice cream, chocolate mousse, pudding, chocolate cake, or brownie) that range from 250 to 400 cal and equal to a MiniBon roll (350 cal).

Procedure

After introduction, participants (excluding those in the control condition) were informed of our interests in getting feedback on a new point-of-purchase advertisement for Cinnabon. To heighten the realism of the experiment, we asked participants to imagine visiting a Cinnabon store that just opened on campus and to picture themselves walking up to the counter to place an order for themselves. Participants were told that, as they approached the counter, they noticed a highlighted message. In the *provincial norm* condition, the message read: "On the [university name] campus, the average total order for Cinnabon customers is 350 calories."

In the *descriptive norm* condition, the message read: "Worldwide, the average total order for Cinnabon customers is 350 calories." In the *control* condition, participants were not asked to imagine noticing a highlighted message and were not presented with any message. All participants then received the same menu for Cinnabon (see Appendix A in the Online Publication for stimuli) and were asked to click on the item(s) they would like to select. Participants were not restricted in the number of options they could select.

After indicating selections, participants rated the extent to which they were satisfied with the order on a series of items (adapted from Jacoby, Speller, and Kohn 1974): "How satisfied are you with your choice?" How content are you with your choice?" "How happy are you with your choice?" and "How unsatisfied are you with your choice?" (reverse-coded). Responses were obtained on a 9-point scale anchored at 1—*Not at all* to 9—*Very* and were averaged ($\alpha = .84$), such that higher values indicate greater satisfaction.

Participants then indicated the total calories of their orders. This measure served as an index of recall accuracy and thus the motivation to align with the norm, as it assessed the extent to which participants attended to calorie information during the order (Wisdom, Downs, and Loewenstein 2010). Note that participants had to recall total calories from memory. They were not able to return to the menu to observe calorie information. Lastly, participants responded to a series of items consistent with our cover story before indicating demographics and being debriefed.

RESULTS

All measures were submitted to a one-way ANOVA with condition (provincial norm, descriptive norm, and control) as the independent variable. Means are listed in Table 1.

Number of Calories Ordered

Results revealed a significant effect of condition on the number of calories ordered, $F(2,57) = 4.95$, $p = .010$. Consistent with Experiment 1, planned comparisons revealed that the provincial norm significantly decreased the total calories ordered relative to the control ($p = .004$) and descriptive norm ($p = .024$) conditions. As expected, the descriptive norm did not influence the total calories ordered relative to the control ($p > .50$).

TABLE 1
Dependent Measures in Experiment 2

Measure	Control	Provincial Norm	Descriptive Norm
Total calories	1,471.11 (178.52)$_a$	737.38 (169.81)$_b$	1,303.25 (174.00)$_a$
Accuracy	869.53 (1,125.63)$_a$	185.10 (268.56)$_b$	636.75 (412.40)$_a$
Satisfaction	7.64 (1.42)$_a$	7.58 (1.33)$_a$	7.29 (1.45)$_a$

Note: Means with the same subscript do not differ from each other, and subscripts should be interpreted within row. Standard deviations are in parentheses.

Accuracy

As a measure of recall accuracy, we compared the actual calories ordered to the recalled calories of the order. Consistent with prior research (Wisdom, Downs, and Loewenstein 2010), recall accuracy was calculated by subtracting the number of calories estimated from the number of calories ordered and computing the absolute value. Lower values indicate greater recall accuracy. Analysis of this accuracy index revealed a significant effect of condition, $F(2,57)$ 4.39, $p = .017$. Planned comparisons revealed that those in the provincial norm condition reported more accurate calorie estimates relative to the control ($p = .005$) or descriptive norm ($p = .058$) conditions. Moreover, those in the descriptive norm condition did not vary in accuracy relative to the control condition ($p > .33$).
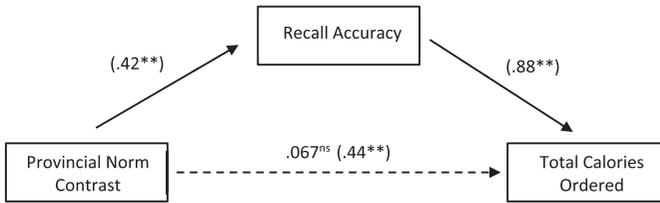
Satisfaction

We tested the extent to which post-choice satisfaction differed based on the message received. A one-way ANOVA compared the two message conditions to the control condition, revealing no effect ($p > .69$). Planned comparisons did not reveal significant differences across conditions relative to the control ($ps > .42$).

Mediation Analyses

We conducted a test of mediation to assess the extent to which the provincial norm reduced the number of total calories ordered as a result of increased motivation to align with the norm. That is, we tested the extent to which the provincial norm message resulted in lower calories ordered due a heightened recall accuracy of the actual calories ordered. Given that the independent variable has three categories, we used indicator coding to create two dummy variables (Hayes and Preacher 2014) using either the provincial norm or the descriptive norm as the indicator variable and the

FIGURE 3
Path Analysis in Experiment 2


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                        ┌─────────────────┐
                        │ Recall Accuracy │
                        └─────────────────┘
         (.42**)          ↗             ↘          (.88**)
   ┌──────────────────┐      .067ⁿˢ (.44**)      ┌─────────────────┐
   │ Provincial Norm  │ - - - - - - - - - - - → │ Total Calories  │
   │    Contrast      │                          │    Ordered      │
   └──────────────────┘                          └─────────────────┘
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NOTE: Values in parentheses indicate standardized beta coefficientsbefore controlling for other variables in the model. **p < .01

control condition coded as the reference group. This method allowed us to separately test mediation for both the provincial norm and descriptive norm conditions relative to the control (while including the opposing contrast as a covariate in the model).

The first mediation test was conducted with the *provincial norm* contrast (i.e., a dummy variable coded such that provincial norm was the indicator variable and the control the reference group). The analysis revealed a significant mediation pathway through the accuracy index (95% confidence interval [CI]: 189.94, 1,127.85; see Figure 3 for full path analysis). The second mediation analysis was conducted with the *descriptive norm* contrast (i.e., a dummy variable coded such that descriptive norm was the indicator variable and the control the reference group). This analysis did not reveal a significant mediating pathway through the accuracy index (95% CI: −298.60, 767.75). Furthermore, there was no difference in the results of the first (95% CI: 186.67, 1,072.04) or second (95% CI: −272.16, 737.33) mediation analyses when including satisfaction as a covariate in the model.

DISCUSSION

As in Experiment 1, consumers exposed to a provincial norm ordered significantly fewer calories, providing support for Hypothesis 1. In the second experiment we provided direct insight into the role of provincial norms in reducing calorie consumption. Specifically, we found that provincial norms heightened motivation to align with the norm, as evident by a more accurate recall of calorie count. In turn, this heightened motivation led to an overall reduction in calories ordered. This effect held despite changes to the norm to account for potential differences in group affiliation. Thus, we find support for Hypothesis 2.

Critics of interventions intended to improve health welfare suggest we risk creating a "nanny state" that may reduce consumer satisfaction (Grunseit et al. 2018). However, beyond documenting the role of motivation to align with the provincial norm, the provincial norms did not impact satisfaction with the choice. Thus, those making healthy choices were just as satisfied with their choices as those making unhealthy choices. We now turn to the counterargument that nudges such as these may lead to unintended negative consequences.

EXPERIMENT 3

We have demonstrated that low-calorie provincial norms reduce consumer calorie content, that this effect stems from increasing motivation to align with the norm, and that the resulting healthier decisions did not undermine satisfaction. The aim of Experiment 3 was to examine whether adherence to a provincial norm leads consumers to overcompensate on subsequent choices. That is, does adhering to a provincial norm in one decision lead consumers to overcompensate and make unhealthier choices on a subsequent decision (i.e., *compensatory effects*: Wisdom, Downs, and Loewenstein 2010)?

We posit that provincial norms will not lead consumers to overcompensate on subsequent choices. Central to the concept of provincial norms is the notion that the norm must be specific to the context to successfully alter behavior (Goldstein, Cialdini, and Griskevicius 2008; see Experiments 1–2). Subsequent decisions imply new contexts, where provincial norms should not influence food choices unrelated to the specific norm. Thus, we do not anticipate any spillover effects (positive or negative) for subsequent decisions not related to the provincial norm. If true, practitioners could freely focus on selected aspects of the menu knowing behavioral change will occur for only norm-relevant decisions.

Experiment 3 had four other related goals. First, we directly assessed the extent to which provincial norms heighten motivation to align with the norm and alter the calorie order because the norms are perceived as more relevant information. Second, we tested the extent to which provincial norms elicited greater guilt, as guilt has been shown to prompt healthier decisions (see Okada 2005). Third, we tested the motivation to align with the norm through a different measure—the extent to which participants were attentive to calorie information. Finally, we altered the domain to test the generalizability of the findings to other indulgent contexts.

We tested these goals in a sequential choice paradigm. Participants were provided with normative information related to a choice (here, the number

of calories in ice cream toppings). We assessed the number of calories selected for the toppings. However, we also asked participants to indicate the size of the cup for the ice cream as a proxy for the amount of ice cream desired. Since the provincial norm is related only to toppings, we expected to observe differences in the norm-relevant choice (i.e., number of calories in toppings) but no differences in the norm-irrelevant choice (i.e., cup size ordered).

METHOD

Participants and Design

One hundred and fifty undergraduate participants (59% Male; $M_{age} =$ 20.45) participated in a study on restaurant menus. Participants were randomly assigned to one of three conditions: a provincial norm condition, a descriptive norm condition, or a control condition.

Procedure

Participants were told that a new restaurant was seeking feedback on its menu design. To increase realism, participants were asked to select something from the menu to eat. All participants were then introduced to the ice cream shop (*32 Below*) and asked to imagine walking into a *32 Below* that just opened on campus and, prior to ordering, a shop worker told them either that "On the [university name] campus, customers order on average 120 calories in ice cream toppings" (*provincial norm* condition) or "Worldwide, customers order on average 120 calories in ice cream toppings" (*descriptive norm* condition). In the *control* condition, participants were not presented with any message.

Participants were then presented with a menu of toppings from *32 Below* and asked to make their selections (see Appendix B in the Online Publication for topping menu). Participants were not restricted in the number of toppings they could select. Following this decision, all participants were presented with a second menu for ice cream cup sizes. Participants were asked to indicate which cup size they would like to choose (see Appendix C in the Online Publication for cup size menu).

Following this scenario, participants were asked to think back to their toppings decision and respond to a series of randomized items. To assess the motivation to align with the norm, participants were asked how attentive they were to calorie count in their toppings order by indicating the extent to which they tried to: Add the calories in your toppings order, pay attention to the calories in your toppings order, and track the number of

TABLE 2
Dependent Measures in Experiment 3

Measure	Control	Provincial Norm	Descriptive Norm
Toppings calories	172.02 (84.85)$_a$	120.25 (81.36)$_b$	159.22 (103.13)$_a$
Total calories	304.78 (93.24)$_a$	286.20 (98.81)$_b$	332.38 (120.02)$_a$
Cup calories	164.76 (28.99)$_a$	165.94 (38.09)$_a$	173.16 (48.03)$_a$
Attention	1.85 (.99)$_a$	2.80 (2.04)$_b$	2.06 (1.92)$_a$
Relevancy	2.86 (1.75)$_a$	4.35 (2.68)$_b$	3.36 (2.34)$_a$
Satisfaction	7.53 (1.31)$_a$	7.56 (1.43)$_a$	7.70 (1.54)$_a$
Guilt	1.61 (1.16)$_a$	2.17 (1.98)$_a$	1.93 (1.74)$_a$

Note: Means with the same subscript do not differ from each other, and subscripts should be interpreted within row. Standard deviations are in parentheses.

calories in your toppings order, on scales anchored at 1—*Not at all* to 9—*Very much* ($\alpha = .95$). To assess *relevancy*, participants were asked to indicate the relevancy of the calorie information to their toppings orders on two items: How relevant was the calorie information to your toppings order? How diagnostic was the calorie information to your toppings order? Scales for the two items ($r = .65$, $p < .001$) were anchored at 1—*Not at all* to 9—*Very*, with higher values indicating a greater relevance. To assess *satisfaction*, participants responded to the same items detailed in Experiment 2 ($\alpha = .88$). To assess *guilt*, participants responded to three items: How guilty do you feel about your decision? How bad do you feel about your decision? How ashamed do you feel about your decision? Scales were anchored at 1—*Not at all* to 9—*Very*, with higher values indicating greater guilt ($\alpha = .93$). Last, participants responded to a series of items consistent with our cover story before indicating demographics and being debriefed.

RESULTS

As in Experiments 1 and 2, the data were submitted to a one-way ANOVA, with the condition (provincial norm, descriptive norm, and control) as the independent variable. Means are listed in Table 2.

Number of Toppings Calories Ordered

Results revealed a significant effect of condition on the total number of topping calories ordered, $F(2,147) = 5.05$, $p = .008$. Planned contrasts revealed the provincial norm condition significantly decreased the total topping calories ordered relative to the control ($p = .002$) and the

descriptive norm ($p = .032$) conditions. The descriptive norm condition did not differ from the control ($p > .35$).

Number of Total Calories Ordered

Analysis of the total calories ordered (i.e., topping calories + cup size calories) again revealed a significant effect of condition, $F(2,147) = 3.97$, $p = .021$. Those in the provincial norm condition ordered significantly fewer calories overall relative to those in the control ($p = .01$) and descriptive norm ($p = .028$) conditions. The descriptive norm condition did not alter the total calories ordered relative to the control ($p > .69$).

Cup Size Ordered

Analysis of the cup size calories ordered did not reveal an effect of condition ($p > .51$).

Attention to Calorie Count

As a measure of the motivation to align, participants indicated the extent to which they attended to calorie information during the toppings decision. Analysis of this attention index revealed a significant effect of the condition, $F(2,147)$ 4.26 $p = .016$. Planned comparisons revealed that those in the provincial norm condition reported being more attentive to calorie information relative to the control ($p = .006$) and descriptive norm ($p = .032$) conditions. The descriptive norm condition did not alter the attention to calorie information relative to the control ($p > .54$).

Relevance

Analysis of the relevancy data revealed a significant effect of condition, $F(2,147) = 5.52$, $p = .005$. Planned contrasts revealed that those exposed to the provincial norm indicated the calorie information as being more relevant to the toppings order than the control ($p = .001$) and descriptive norm ($p = .031$) conditions. The descriptive norm condition did not differ from the control ($p > .27$).

Satisfaction and Guilt

Analysis of post-choice satisfaction ratings did not reveal an effect of condition ($p > .81$). Similarly, analysis of the guilt data did not reveal an effect of condition ($p > .51$).

FIGURE 4
Path Analysis in Experiment 3
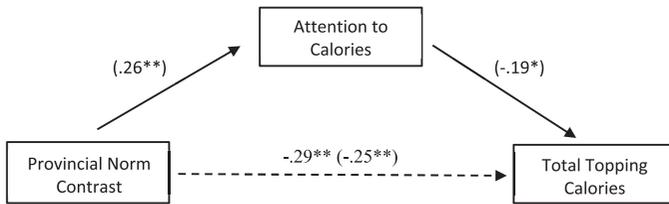
NOTE: *Values in parentheses indicate standardized beta coefficients before controlling for other variables in the model. *p < .05; **p < .01*

Mediation Analyses

We again conducted a formal test of mediation to assess the extent to which the provincial norm reduced the total toppings calories ordered as a result of heightened motivation to align with the norm—here in the form of attention to calorie information. With the three-level independent variable, we used indicator coding to create two dummy variables to separately test mediation for both the provincial and descriptive norm conditions relative to the control (see Experiment 2; Hayes and Preacher 2014).

The first mediation analysis was conducted with the *provincial norm* contrast (i.e., a dummy variable coded such that provincial norm was the indicator variable and the control the reference group). The analysis revealed a significant mediation pathway through the attention index (95% CI: −17.40, −.70; see Figure 4 for full path analysis). The second mediation analysis was conducted with the *descriptive norm* contrast (i.e., a dummy variable coded such that descriptive norm was the indicator variable and the control the reference group). This analysis did not reveal a significant mediating pathway through the attention index (95% CI: −9.63, 1.89). Furthermore, there was no difference in the results of the first (95% CI: −19.87, −1.12) or second (95% CI: −9.89, 1.87) mediation analyses when including satisfaction and guilt as covariates in the model. This finding is consistent with Experiment 2.

As a separate analysis, we included relevancy as a proximal mediator in a serial mediation model. The rationale for this analysis is that provincial norms increase motivation to align by heightening the relevancy of the focal information—here, information specific to the toppings. Consequently, we computed a serial mediation analysis that generated a 95% CI around the effect of the provincial norm contrast on number of toppings

calories ordered through relevancy (first) and attention (second) (Model 6, Hayes 2013). The analyses revealed a significant serial mediation pathway (95% CI: −11.99, −.24). In short, the effect of provincial norms on fewer toppings calories ordered was mediated by an increased relevancy of calorie information which heightened attention to calorie count. Consistent with expectations, the mediating pathway for the descriptive norm contrast was not significant (95% CI: −6.74, .27). Again, neither result was impacted by including satisfaction or guilt as covariates in the model. Finally, reversing the order of the mechanisms did not reveal a significant serial mediation pathway for either the provincial norm contrast (95% CI: −4.07, 5.82) or the descriptive norm contrast (95% CI: −1.13, 2.84).

DISCUSSION

Experiment 3 demonstrates that adherence to provincial norms does not lead consumers to overcompensate on calories ordered for subsequent decisions. We found the positive effect of a low-calorie provincial norm (i.e., calories of toppings) was relegated to the norm-relevant choice (i.e., calories ordered with respect to the toppings only). There was no effect of the provincial norm on the norm-irrelevant choice (i.e., selection of cup size). The lack of an overcompensation effect is especially telling, as research demonstrates that consumers who make healthier decisions can overcompensate on subsequent decisions by making less healthy decisions (Wisdom, Downs, and Loewenstein 2010). Here, however, the provincial norm only altered behavior related to the norm (i.e., the calories in toppings). From a practical perspective, in support of Hypothesis 3, this finding suggests managers may freely pick and choose aspects of the menu to emphasize with provincial norm messages, knowing consumption behavior will be altered for only norm-relevant decisions.

Furthermore, the findings of Experiment 3 provide additional support for Hypothesis 2 related to our proposed mediator. Exposure to provincial norms reduced the calories ordered through an alternative instantiation of motivation to align with the norm—a heightened attention to calorie count. This motivation was shown to stem from the posted calorie information being perceived as more relevant when connected to a provincial norm. A serial mediation model demonstrated that the effect of provincial norms on reduced calorie intake stemmed from an increased relevance in the calorie information that subsequently heightened motivation to attend to calorie count, further supporting Hypothesis 3. Moreover, the findings of Experiment 3 again demonstrated that provincial norms did not alter satisfaction despite leading to healthier decisions. Finally,

exposure to provincial norms had no effect on guilt and thus is not sham-
ing consumers into healthier eating (see Khan, Dhar, and Wertenbroch
2005).

GENERAL DISCUSSION

Despite the FDA's mandate requiring the posting of calorie informa-
tion, research has demonstrated that consumers often do not incorpo-
rate calorie information into their judgments (see Long et al. 2015). In
response, we focused on a social marketing technique that leverages the
use of provincial norms to increase the efficacy of posted calorie infor-
mation for healthier consumption. Given that provincial norms highlight
specific behavior highly relevant to the consumption context, we argued
that exposure to provincial norms heightens motivation to align with the
norm. This increased motivation to align with the norm increases the
extent to which consumers make healthier decisions. In support of this
conceptual model, a field and two lab experiments demonstrate that rel-
ative to a baseline condition (i.e., control), consumers reduced the total
calories ordered when exposed to provincial norms and not descriptive
norms. Across studies, comparison of the norm conditions revealed a
significant decrease in calories ordered for those exposed to provincial
norms relative to those exposed to descriptive norms. These findings
occurred across different locations, different contexts, and different caloric
averages.

This calorie reduction occurred because of an increased motivation
to align with the norm. The motivation to align was operationalized
by both a heightened recall of calorie information (Experiment 2) and
greater attention devoted to calorie content (Experiment 3). The findings of
Experiment 3 showed this motivation to align stemmed from perceiving the
posted calorie information as more relevant when connected to a provincial
norm. This effect was shown to be independent of alternative explanations
related to anchoring (see discussion of Experiment 1) or guilt (Experiment
3). Thus, low-calorie provincial norms successfully reduce calories ordered
and this effect appears to stem from heightening consumer motivation to
align with the norm.

Our findings reveal two additional intriguing effects. First, the effect of
provincial norms on healthier consumption did not alter levels of satisfac-
tion (Experiments 2 and 3). As such, provincial norms represent a means
by which consumers can desire fewer calories without sacrificing satis-
faction with their choices (see also Block et al. 2011). Second, the effect
of provincial norms did not induce any carryover effects. Specifically, in

Experiment 3, we presented participants with a norm-relevant choice (i.e. the toppings for ice cream) and a norm-irrelevant choice (i.e., the cup size). While research supports the possibility that a healthier choice on toppings would translate to a healthier choice on cup size (i.e., *a halo effect*: Nisbett and Wilson 1977), other research supports the possibility that a healthier choice on toppings would lead to an unhealthier choice on cup size (i.e., *compensatory effects*: Wisdom et al. 2010). Yet neither finding was observed, suggesting that the impact of the provincial norm may be dependent on the relatedness of the decision at the exclusion of subsequent decisions.

To combat the American obesity problem, the USDA (2015) Dietary Guidelines Advisory Committee (DGAC) recommends placing limits on indulgent foods including sweets and desserts. Specifically, the DGAC recommends economic and taxing policies to generate earmarked revenue to encourage production and consumption of healthy foods. The DGAC places proper emphasis on reducing the intake of empty calories, as is our emphasis in these studies. We, however, present a less heavy-handed alternative to act with more of what Richard Thaler calls "libertarian paternalism," to help or nudge people do what they want to do—which is be healthy (see Thaler and Sunstein 2003).

Furthermore, by testing our experiments in indulgent contexts, we offer a more stringent test of our predictions, as unhealthy consumption contexts should make it harder for consumers to make healthier decisions. Indeed, consumers are less likely to account for calorie information when not health conscious or in indulgent contexts (Girz et al. 2012; Harnack and French 2008; Lowe et al. 2010; Wisdom, Downs, and Loewenstein 2010; cf., Ellison, Lusk, and Davis 2013). Consequently, the present research illustrates how to increase the efficacy of calorie information for consumers who need it most as well as in contexts when consumers are least likely to use it otherwise. Moreover, in nonindulgent contexts (e.g., sandwich shops, smoothie stores), we anticipate that the use of provincial norms should only bolster the likelihood that consumers will make healthier choices.

CONSUMER-BASED STRATEGIC IMPLICATIONS

The purpose of this research is to increase the effectiveness of the calorie information mandate using provincial norms to nudge consumers toward healthier decisions (Allcott 2011; Blumenthal-Barby and Burroughs 2012; Payne et al. 2015). We outline several actionable responses for issues faced by managers, practitioners, and policymakers seeking to enhance healthier consumption using social marketing techniques (see Shah et al. 2014).

Strategic Communications

Provincial norms are used in practice in a variety of settings (e.g., utilities industry; Allcott 2011; Schultz et al. 2007). Our studies demonstrate that provincial norms encourage healthier food consumption. Thus, provincial norms adapted to fit precise audiences (e.g., restaurant customers, mobile app users) offer a unique opportunity to influence behavior at the time of consumption. We next discuss possibilities related to the various modes of communication that may be used to disseminate provincial norms.

Digital modes of communication provide a fruitful avenue to quickly disseminate (and update) information with little lead time necessary to change online content. Consumers often go online to preview or order from restaurant menus. For example, approximately 1.2 million digital orders are placed each week at Panera, accounting for 26% of total sales (Meyer 2017). This provides an opportunity for restaurants like Panera to incorporate provincial norms into online ordering (e.g., "40% of diners at this store order an apple with Panera's Pick 2 order instead of chips."). With geotargeting, messages could be tailored with contextually-specific provincial norm information adapted to the current user experience. Selected web analytics could push accurate data about such norms into the messaging in real time. Web content algorithms could include built-in limits or decision rules to display provincial norms that nudge healthier consumption.

In addition to digital modes of communication, other opportunities exist to influence consumption behavior via more traditional means. Provincial norms could be printed on tangible menus (Experiment 2), in-store signage could be located at different points of purchase in the retail environment (Experiment 1), or the norm could be directly communicated by an employee or waiter (Experiment 3)—indeed, waiters often do so when asked, by recommending what the majority of customers order in the specific context. Critical to this research, a variety of means are practically available, at little cost, to strategically communicate provincial norms to consumers during the consumption experience which benefit consumer well-being.

Utilizing Accurate Norms

Given the different means by which provincial norms can be implemented to impact decision making, it raises the question of how to emphasize health information in a manner that is honest and accurate. Policymakers and food retailers should look for ways in which consumers

already demonstrate healthy eating behaviors. For instance, the average calories ordered regarding toppings (see Experiment 3), the average calories ordered in side dishes, and the average calories ordered for a certain time of day are all means by which provincial norms can be emphasized in an honest and accurate way. Critically, this research finds that compensatory effects are not likely to occur because of provincial norms, so marketers can emphasize these norms knowing that consumers are unlikely to overcompensate with subsequent decisions. In other words, marketers can successfully reduce the calories that consumers order by focusing on specific aspects of the consumption experience.

Furthermore, if marketers present a true average of calorie totals (even when the calorie average is not optimal), we would expect it not to affect the calories ordered for the average consumer, but instead for the above-average consumer. The outliers from the average (i.e., those ordering a higher than average calorie total) could be expected to be brought down. Similarly, new visitors to a restaurant should be less likely to order significantly above the presented provincial norm and thus could be positively influenced.

Firm Incentives

A likely concern of food retailers is the impact of this altered behavior on the bottom line. Will healthier choices result in decreased profits for retailers? To offer insight into this question, we analyzed the Cinnabon profit data by condition from Experiment 1. The analysis revealed no significant difference in profits to Cinnabon for those in the provincial norm or descriptive norm conditions relative to the control ($ps > .20$). Furthermore, we analyzed the number of items ordered in Experiment 1. The analysis revealed no significant difference for those exposed to a provincial norm or descriptive norm relative to those in the control condition ($p > .33$). This finding is consistent with prior research which finds that when consumers account for calorie information, they tend to alter the consumption choices made rather than the quantity of the items purchased (VanEpps, Downs, and Loewenstein 2016a).

Consistent with provincial norms not having a financial trade-off for businesses, we find it important to touch upon the *cost efficiency* associated with using provincial norms. That is, the cost associated with implementing provincial norms (i.e., following the suggestions above) should be nominal if not zero costs. Printing provincial norms on menus should require little additional cost for restaurant owners. Provincial norms could even be printed on removable stickers to avoid permanent menu change. On the

other hand, having employees relay provincial norms would require no cost. This cost efficacy is undoubtedly critical in encouraging practitioners to implement provincial norms, especially given the costs to businesses that have been associated with presenting calorie information in line with the mandate or that might be subject to increased taxation (perhaps thereby reducing sales). Thus, provincial norms represent a cost-effective means to increase the efficacy of the mandate without requiring changes to the mandate.

Finally, beyond cost-efficiency incentives, we believe the findings speak to strong incentives related to corporate social responsibility (CSR). CSR refers to the social obligation of firms to engage in desirable business practices (see Maignan and Ferrell 2004). Here, provincial norms are beneficial to the well-being of society as they represent a means by which to help combat the obesity epidemic. Importantly, firms not only can engage in CSR, but have an opportunity to create positive firm value (for a related argument see Barone, Miyazaki, and Taylor 2000). First, this social initiative could create positive public relations that stem from helping consumers eat better. Second, given that CSR has been shown to increase consumer loyalty (Du, Bhattacharya, and Sen 2007), it is not unreasonable to suggest that increased loyalty could stem from this initiative. Given provincial norms were not shown to alter choice satisfaction in Experiments 2 and 3, food retailers can expect healthier consumers without compromising happiness.

THEORETICAL CONTRIBUTIONS

This work offers several key contributions to our understanding of the impact social norms exert on consumer behavior (Bearden and Etzel 1982; Cialdini 1993; Cialdini, Kallgren, and Reno 1991; Cialdini, Reno, and Kallgren 1990; Hechter and Opp 2001). The findings distinguish between provincial and descriptive norms and demonstrate that norms are not created equal; indeed, the *type* of norm as well as its *specificity* demonstrates distinct effects on behavior. While it is tempting to group provincial and descriptive norms under the same label (e.g., Scheibehenne, Jamil, and Wagenmakers 2016), this research speaks to important differences in the efficacy of these norms and the clear need to disambiguate between the two in both research and practice.

A critical aim of this research was to investigate how provincial norms alter behavior (independent of descriptive norms). Researchers have offered speculation about potential mechanisms (Goldstein, Cialdini, and Griskevicius 2008), yet this work is the first to directly detail the process

by which provincial norms influence consumer behavior (i.e., the motivation to align with relevant information). In doing so, this research offers a novel conceptual framework critical to not only understanding *why* provincial norms alter behavior but also *how* provincial norms would best be also used as an intervention strategy to nudge decision making in other domains (e.g., medical care, recycling, physical fitness, and smoking).

FUTURE DIRECTIONS

The current body of work suggests at least four fruitful avenues for future research. First, future work should consider the influence of provincial norms on consumers in nonindulgent contexts. As addressed in our studies, provincial norms would be expected to bolster consumers' likelihood to make healthy choices. However, one might expect a floor effect of provincial norms in highly nonindulgent (e.g., healthy) settings. In other words, in contexts in which consumers are already motivated to make healthy choices (e.g., salad bars, sandwich shops, juice bars, etc.), there might not be much room left to either motivate consumers or for consumers to further reduce calorie orders. Of course, this assumes consumers eating in healthy settings are health conscious (see Bleich et al. 2017). On the other hand, if consumers are not highly health conscious (e.g., those who only visit because they live nearby or because they are accompanying a friend), our findings suggest provincial norms will positively influence the likelihood of consumers making healthier choices in other settings.

Second, future research should consider the timing of presentation of provincial norms. In this research, participants were presented with provincial norms prior to making an order. However, if consumers were presented with a provincial norm *after* coming to a decision, would the influence be so strong as to change the decision? While we do not directly test this question, Experiment 1 offers insight into this possibility. Given the likelihood at least some participants had an order in mind prior to being approached in line at Cinnabon, the results of the field study revealed that provincial norms were effective in reducing calorie consumption. Thus, we might speculate that these effects could occur above and beyond prior preferences or that provincial norms could successfully alter decisions already made. Future studies could examine such timing effects.

Third, across three experiments, we find that provincial norms outperformed descriptive norms. However, this difference begs the question as to whether other types of norms could exhibit positive effects on consumer calorie consumption. Take *injunctive norms*, for instance (Reno, Cialdini,

and Kallgren 1993; see Schultz et al. 2007). Injunctive norms focus on what people *ought* to be doing (e.g., "Consumers should order a snack that averages 350 calories.") versus what people *actually* do (i.e., descriptive and provincial norms). Injunctive norms can be very powerful (Larimer et al. 2004). However, given these norms highlight what consumers *should* do, we would expect any positive effect of these types of norms to operate through feelings of guilt. That is, consumers may reduce calories ordered when exposed to injunctive norms to avoid feelings of guilt for not aligning with the low-calorie norm. Thus, while injunctive norms may prove an effective means of reducing calorie consumption (cf. Mollen et al. 2013), they may also decrease satisfaction or increase overconsumption as a function of this feeling of guilt (Fisher 2010).

Finally, we encourage future researchers to investigate new means by which provincial norms could be used to influence consumption behavior on a broader scale. For instance, might public service announcements (PSAs) be able to leverage the efficacy of provincial norms? It is no surprise that local policymakers often craft PSAs to promote healthy behavior (e.g., AAP 2004; OAC 2015). To increase the effectiveness, PSAs could highlight the provinciality of the norm by referencing a specific city, region, type of food, consumption time, or a combination of the aforementioned. Although PSAs would not be tied to a particular food retailer or restaurant, they should aid in increasing the motivation for alignment, which then might increase the likelihood that consumers account for calorie information *when* they make relevant consumption decisions.

CONCLUSION

In accord with the Patient Protection and Affordable Care Act of 2010, the FDA has now mandated the direct posting of calorie information on menus. Although this mandate intended to help consumers make healthier decisions, extant research has highlighted that the posting of calorie information can often be ineffective (see Long et al. 2015). In response, we focus on altering the efficacy of this mandate through a social marketing technique that strategically leverages the power of provincial norms. A field and two lab experiments demonstrate that as a consequence of heightening consumer motivation to align with the norm, low-calorie provincial norms lead consumers to order fewer calories. Exposing consumers to provincial norms provides a clear and effective means of improving the efficacy of posted calorie information to nudge consumers toward healthier consumption choices in indulgent contexts.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

APPENDIX A. Menu Used in Experiment 2
APPENDIX B. Toppings Menu Used in Experiment 3
APPENDIX C. Cup Size Menu Used in Experiment 2

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