Childhood Obesity, Parents´ Knowledge and Report Cards

PRELIMINARY AND INCOMPLETE
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Abstract

Using a randomized field experiment, we study the impact of body mass index report cards on parental attitudes and behaviors in Mexico, a country with one of the highest obesity rates. Parents in all treatment groups received information about the height and weight of their children and their child's weight status (i.e., underweight, healthy weight, overweight, or obese) and the type of information varied across treatment groups. The intervention increased parental awareness of their child's weight and feelings about their child weight but there were few meaningful changes in parental behavior or children's body mass index.

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I Introduction

The incidence of childhood obesity has risen dramatically across both developed and developing countries. While the tripling of rates of childhood obesity in the US over the last 3 decades has boded much attention (Centers for Disease Control, 2011), the recent trends in developing countries are often more stark.[1] In Mexico, the country with one of the highest obesity rates in the world (El Universal, January 22, 2010), rates of childhood obesity doubled in a short period between 1999 and 2006 (Rivera et al., 2001; Olaiz et al., 2006).[2,3,4]

These statistics have triggered wide concern as childhood obesity is associated with many adverse outcomes. Obese children are more likely to be obese adults but also face more short-term consequences such as an elevated risk of hypertension and type 2 diabetes in addition to detrimental psychological consequences of low self-esteem and discrimination (Chomitz et al., 2003; Dietz, 1998; Must et al., 1999; Must and Strauss, 1999). As such, the impact of childhood obesity is likely multi-dimensional; the rapid increase in obesity at young ages will likely have implications for adult health, human capital formation, labor market opportunities and other socioeconomic outcomes (Cawley, 2004; Daniels, 2006; Taras and Potts-Datema, 2005).

There has been much discussion about what can be done to counteract these changes. Popular proposals include the removal of vending machines from schools, the eradication of food vendors on school property (in the case of Mexico), taxing soda, and increasing physical activity in schools. But these policy initiatives are often expensive, require significant changes in the school environment, or meet political resistance. For instance, increasing the amount of time in physical activity classes will require less class time to be spent on academic

[1] According to CDC classifications, a child is classified as obese if she/he has a body mass index (BMI) exceeding the sex- and age-specific 95th percentile from the 2000 CDC Growth Charts. BMI is equal to individual's body weight (in kilograms) divided by the square of his or her height (in meters).

[2] In 1999, 5.3 percent and 5.9 percent of male and female children, respectively were obese, and in 2006, those percentages were 10.8 percent and 9 percent (Olaiz et al., 2006).

[3] Data on the heights and weights of Mexican school-aged children are only available for more recent years.

[4] Rates in the US were relatively stable rising from 13.9 percent to 15.5 percent during the same period. Statistics come from `http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm`.

subjects, but with increasing pressure on test scores, such a change is likely infeasible. As an alternative, less-costly and likely less-intensive information interventions, which have shown promise in other domains (e.g., encouraging students to finish high school (Jensen, 2010), helping low-income families choose schools (Hastings and Weinstein, 2008), reducing AIDS prevalence (De Walque, 2007; Dupas, 2011a)) might be particularly effective. Indeed many obesity-related policies, such as mandatory posting of calories on menus (Bollinger et al., 2011; Wisdom et al., 2010) and nutritional labeling (Jayachandran and Cawley, 2006) are built around the idea that information could have a powerful effect on behavior. Such information interventions could be particularly effective in developing countries, our focus, where individuals, on average, have low levels of education.

One tailored information campaign of recent interest is the dissemination of children's body weight and height report cards (BMI report cards) to parents. Arkansas, New York City, the United Kingdom, and Malaysia have implemented them (Evans and Sonneville, 2009; Schocker, April 19, 2011).[5] Over time, more and more states have a BMI calculation to student's academic report card.[6] Empirical evidence on the effectiveness of report cards is limited. As Centers for Disease Control (2009) states:

> Little is known about the outcomes of BMI measurement programs, including effects on weight-related knowledge, attitudes, and behaviors of youth and their families. As a result, no consensus exists on the utility of BMI screening programs for young people. The U.S. Preventive Services Task Force concluded that insufficient evidence exists to recommend for or against BMI screening programs for youth in clinical settings as a means to prevent adverse health outcomes.

For developing countries, there is no research on the efficacy of BMI report cards.

We argue that a tailored health information campaign, such as BMI report cards, may be particularly successful for two main reasons. First, the general consensus in the health

[5] Additional areas have BMI surveillance programs where students are weighed on a regular basis but only aggregate statistics are reported (Nihiser et al., 2009).

[6] `http://www.huffingtonpost.com/2011/04/19/bmi-schools_n_850776.html`.

literature is that personalized health campaigns are more effective than non-personalized health campaigns (Hawkins et al., 2008). Recent research suggests that tailored interventions are more likely to activate areas of the brain important for self-awareness (Chua et al., 2011), which later are important for precipitating behavioral change. Second, under the Health Belief Model (Hochbaum et al., 1952), a highly-cited psychological model which attempts to explain health behaviors, a person must understand their vulnerability to disease, before behavioral change can occur.

Using a randomized-controlled design, we study the impact of BMI report cards on parental obesity-related attitudes and behaviors and body mass index for nearly 3,000 elementary school students in Mexico. Because parents control much of the child's environment, one of the likely prerequisites for observing effects on children's outcomes is to observe effects on parental behaviors and attitudes. Our outcome variables come from surveys of parents, height and weight measurements, and rates of participation in an information session on healthy eating and physical exercise. The later data sources have the advantage of not being self-reported.

Children were randomized into 1 of 4 groups: a control group and 3 treatment groups. Parents of children in the treatment groups received information on the height and weight of their children and their child's weight classification (i.e., underweight, healthy weight, overweight, or obese). Two of the treatment groups received additional information to understand whether the type of information is important. The first of these focused on the health risks of obesity and the other provided the weight distribution of peers in the child's class. Information on the health risks was expected to make the consequences of the child's weight more salient to parents. This may be particularly important given that many individuals exhibit present-biased preferences in regards to health-related behaviors (DellaVigna and Malmendier, 2006; Giné et al., 2010). Aizer and Stroud (2010) estimate that the 1964 Surgeon General's report on the harmful effects of smoking reduced the rates of smoking among the most-educated. The peer distribution treatment was intended to test

the importance of social norms; that is whether the knowledge that one's child is obese or overweight has a diminished impact if a large fraction of the child's peer is obese or overweight. In our data and elsewhere (Ali et al., 2011), parents of obese/overweight children exhibit less parental concern about their child's weight status the larger the fraction of the child's peers who are overweight/obese.

The BMI report card intervention increases parental knowledge of their child's weight. At baseline, 33% of caretakers of overweight children and 6% of caretakers of obese children correctly report their child's weight status. Following the intervention, those percentages rise to to 59% and 20% respectively. Despite this change, we observe no meaningful changes in behaviors, including enrollment in a sports class, seeing a doctor in regards to the child's weight, and encouragement to increase physical activity, nor in intentions for the future in regards to increasing physical activity or reducing the quantity of food consumed. Parents of boys, however, are more likely to discuss their child's weight with family and friends. The null results on children's weight and BMI are surprising as the intervention did change parental attitudes about whether parents' beliefs about whether they thought that their child weighed too much.

Our results suggest that the dispersion of BMI information is simply not enough to induce change. What is less clear is why and how the delivery of information could lead to changes in parental behaviors and children's outcomes. We leave these questions for future research to address. For instance, our intervention may not have had impacts on parental actions or children's weight because Mexican families do not have the resources or knowledge to act upon the BMI information or because of Mexican cultural attitudes towards obesity. Any effective intervention needs to address these issues. More generally, our findings imply that in order for informational interventions to be success, researchers need to think carefully about individuals have the ability to act upon their new knowledge, especially in the context of developing countries.

II The Field Experiment

A Description of Field Experiment

We carried out our field experiment in the city of Puebla, Mexico, the fourth largest city in Mexico (1.5 million people). Puebla is located in Central Mexico. In 2000, average income per capita in the city of Puebla was about 9,843 US dollars, less than the national Mexican average of 7,025 US PPP 2005 dollars.[7]

We selected 7 primary public schools to participate.[8] We sampled students from second through sixth grade with the bulk of students from third through fifth grade. In January 2010, we distributed baseline surveys to students to take home for parents to complete. This survey collected information on parental education, occupation, concern about H1N1, child's weight, own weight, child's performance in school, their classification of the child's weight, and rates of time preference. Following the receipt of the baseline survey, nutritionists weighed and measured all students in the participating classes. Students' weight status was classified using the BMI-for-age weight status categories and corresponding percentiles established by the Center for Disease Control (CDC).[9] Given the dearth of research on obesity in Mexico despite its pervasive incidence, this combination of data from different surveys provides a valuable resource for understanding the obesity epidemic in Mexico. As such, we incorporate extensive descriptive analyses in our study.

After the collection of the weight and height information, we randomized students into one of four groups: three treatment groups (BASIC, RISK, and COMPARE) and a control group. Note some students have siblings in school who were also part of the experiment. As such, children of the same household could be assigned to different treatments. Later,

[7]These statistics are come from the 2000 Mexican Census. See `http://www.puebladelosangeles.gob.mx/wb/pue/ingreso_percapita_anual_por_municipio_de_la_zona_m` for the Puebla statistic.

[8]We chose schools that were neither the poorest or the richest schools in the urban area. Then we restricted the sample further to schools who expressed an interest in participating.

[9]According to the CDC, students are classified underweight if their weight is less than the 5th percentile, healthy weight if their weight is between the 5th percentile to less than the 85th percentile, overweight if their weight is between the 85th to less than the 95th percentile, and obese if their weight is equal or greater than the 95th percentile.

as a robustness check, we consider only families with one child in the experiment and our results are quantitatively similar. We stratified the randomization based on the combination of school, weight status, and whether or not the baseline survey was completed. Thus, in our analysis, we include strata fixed effects. The treatment groups received basic information about their child's weight and height but varied in the type of additional information. Note, that we refer to these report cards as BMI report cards, but in fact, we reported only the height and weight of the child and never the BMI. That is because in a less-educated population, such as the one we studied in Mexico, BMI would be less meaningful to parents as [10] For the treatment group, we sent home the weight/height report cards in sealed envelopes to parents along with a letter informing parents that the child's weight and height had been measured at school. We provided parents with a nutritionist to contact free of charge if parents had further questions; only a handful of parents contacted her.

The BASIC treatment group received a personalized health report card that detailed the child's height, weight, and weight classification (i.e., underweight, healthy weight, overweight, or obese). Also we provided the ranges of weights for child's height for each of these classifications. The RISK treatment group received the same information as the BASIC treatment, but in addition, had a script identifying the health risks of the weight categorization. For obese or overweight children, the message was "Obese/overweight children are at higher risk of living shorter lives and developing diseases such as diabetes, high blood pressure, heart disease, asthma, and cancer." For underweight children, the relevant text was "Underweight children run a higher risk of malnourishment, low scholastic achievement, and low resistance to illness." The parents of healthy weight children received information on the health risks for being overweight/obese. The final treatment group, the COMPARE treatment group obtained the same information as the BASIC treatment but also received information about the number of children in the child's class in each of the weight categories: underweight, healthy weight, overweight, or obese).

[10]Discussions with parents, school teachers, and officers at the Ministry of Education in Puebla confirmed this.

All treatment groups received an invitation to attend an information session entitled "Practical Tips for Improving Your Child's Eating Habits and Physical Activity." The control group did not receive a report card but did, however, obtain an invitation to this information session. Each school had two of these information sessions. The main motive for this invitation was to obtain a non-survey measure of parents' reaction to the weight/height report card; attendance at this session was one of our main outcome variables. For instance, a mother may say that she intends to change the habits of her child in response to the report card but we care mostly about how the report card translates into behavior. The information sessions occurred a week after the delivery of the weight/height report card.

After these sessions, in March 2010, we gave students a post-intervention survey for their parents to complete. This survey was intended to capture parental response to the report card information; the control group also was asked to complete the survey.[11] In particular, we asked parents whether they had taken particular actions - seen a medical professional in regards to the child's weight, put the child on a diet, had the child skip meals or snacks, encouraged the child to increase physical activity, engaged in physical activity with the child, discussed the child's weight with him or her or family members or friends, had the child skip meals or snacks, and/or signed the child up for a sport or exercise class. Questions about these particular actions were derived from the public health study on body mass index of Kalich et al. (2008). We also inquired about parental intentions in the future to change the amount of food the child consumed and the amount of exercise he or she partook in. The post-intervention survey finished with a series of questions about health knowledge and knowledge or their child's weight status. In the second half of May 2010, the nutritionists measured the heights and weights of both the treatment and control children again to see if the intervention has had any impact on children's weight.

It is important to note that the randomization was at the individual level rather than the school or grade level. Given the level of randomization, there is the possibility of cross-

[11]Parents attending the information session were asked to fill out a post-intervention survey at the information session.

contamination effects which may bias our estimates. Specifically, one might imagine that a parent receiving the BASIC treatment report card may become more concerned about his/her child if the parent discusses the report card with a parent who received the RISK treatment report card. We recognized the possible existence of such spillover effects when designing our experiment. Our funding limited our ability to do school-level randomization, which would have necessitated a larger sample size. We tried to make the information private by delivering the report cards in sealed envelopes at home in an effort to reduce cross-contamination effects. Furthermore, arguably, it is foreseeable that any spillover effects, if they exist, might dampen the differences between the treatments and the control group, leading us to be biased against finding any significant effects of the intervention on behavior. We, however, believe the spillover effects to be small. Specifically, one might expect that the spillover effects would be larger for families with multiple children in the experiment than with families with only one child in the experiment. The effects, as shown, later are similar for both types of families.

B Sample and Summary Statistics

Table 1 provides the means for key variables across the 3 treatment groups and the control group in the pre-treatment period. In the last two columns, we present p-values from two tests: one testing the equivalence of overall treatment group mean (combining the three treatment groups together) and the control group mean and the other testing the equivalence of the means of all four groups. The randomization worked well; only for concern about child's weight and concern about child's school performance do we observe statistically-significant differences at the five percent level when testing for the equivalence of the means for all groups. The differences, however, are slight and suggest that parents in the control group are slightly more concerned about their children on a number of dimensions.

In total, there were over 2,700 children who participated in our study, nearly equally divided across the different groups. Obesity rates among these young children hover just

over 10% and overweight rates are just under 20%.[12] These correspond well with those of the 2008 National Schoolchildren Survey (Encuesta Nacional de Salúd en Escolares 2008, (Levy, 2010)); for primary school children within the state of Puebla, 27.6% of boys and 23.9% of girls are classified as obese or overweight. In our sample, 33.6% of boys and 26.5% of girls are obese or overweight.

In Panel B, we examine the responses to the baseline survey. We asked that the primary caretaker of the child complete the survey. In 67% of responses, it was the mother and 30% of responses it was the father. The response rates are quite high - 72 to 74%, especially since they were administered as take-home surveys given to students to return. Overall education attainment is low; over 30% of primary caretakers had not completed high school. To gauge how concerned parents were about obesity, we asked parent about their level of concern on several dimensions - e.g., child's weight, H1N1, and child's performance in school. Parental concern about their child's weight was the lowest of all three concerns. Moreover, parents seem to be slightly more concerned about their child's weight than their own weight.

Since many of our outcome variables are survey-based, for our main analysis sample, we choose to focus on the sample of children whose caretaker completed the baseline survey. To ensure that the randomization was adequate for this sample, in Appendix Table 1, we present the table analogous to Table 1 for this sample. Since we performed the randomization stratifying on weight status and completion of the baseline survey, it is unsurprising that we find no real differences in characteristics across the four groups.

Before discussing the results of our intervention, it is important to understand the degree of scope for the report cards to affect behavior. To this aim, in Table 2, we examine parental misperceptions of their children's weight by looking at parental classification at baseline versus actual classification of weight status. If caretakers can accurately classify their child's weight, we might not expect that the report cards to impact behaviors aside from a salience effect. But 67% of caretakers of overweight children and 94% of caretakers of obese children

[12]For comparison, among children of this age in the US, the obesity rate was 19.6 percent. See `http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm`.

underestimate their children's weight status. These misclassification percentages are much higher than those found in US samples (Neumark-Sztainer et al., 2008; Warschburger and Kroller, 2009); for these studies, the misclassification rates range from 35 to 50%. Misclassification rates are higher among the low educated (analysis not reported), giving credence to the idea that the possible impact of report cards is greater in developing countries.

Even if report cards change these misclassification rates, it is not immediately clear that parents will engage in their children in healthier behaviors, especially if being characterized as obese or overweight does not raise parental concern. In Table 3, we correlate the primary caretaker's concern about the child's weight with the actual classification. If caretakers are very unaware of their child's weight and/or their child's weight is of little concern to them, we would expect to observe no relationship between concern and weight status. However, concern exhibits a u-shaped pattern with parents most concerned about the weight of underweight and obese children. As such, it seems that some caretakers are aware of the problems associated with having too little or too much weight.

We next explore the degree to which caretaker education predicts child's weight status in Table 4. If part of the reason why some children are obese or overweight is due to limited knowledge about the risks of obesity or deficient resources (e.g., limited access to healthy foods), we might expect that rates of obesity/overweight are higher among the less educated. Each column of Table 4 reports the estimates from separate linear regressions of weight status (i.e., underweight, overweight, and obese) on the educational attainment of the caretaker and the sex of the child. Rates of obesity are higher among male children and interestingly, parental education is positively correlated with obesity risk, a common finding in developing countries, particularly Mexico (Hernández et al., 2002; Martorell et al., 2000; Ullmann et al., forthcoming). From this later finding, it would be difficult to conclude that a lack of information or poverty is the main driver of obesity in Mexico.

As many of the contributing obesity factors (e.g., unhealthy eating and physical inactivity) motivate models of self-control, it is natural to think that obesity is related to time

inconsistency.[13] Our baseline survey collected answers to standard time preference questions.[14] We label individuals as time inconsistent if the money needed to make them wait one month before receiving is larger when considering the tradeoff between today and a month from now compared to the tradeoff between 6 months from now and 7 months from now. Nearly 23% of our sample is classified as time inconsistent. In the Philippines sample of Ashraf et al. (2006), roughly 25% are time inconsistent. In Table 5, we examine whether time inconsistency is predictive of BMI and rates of underweight, overweight, and obesity. Since this measure may be related to wealth, we include controls for parental education and school fixed effects along with sex and child's age in months in the regressions. Overall, none of the relationships is statistically significant at the 5% level. However, the noteworthy finding is that the sign of the relationships in general are opposite in sign of that predicted - implying that the time inconsistent are less likely to have children who are obese and have children with lower BMI values. Of course, there are some cautions one make take in interpreting these regressions - i.e., the usual problems of measuring time inconsistency via surveys and one's own BMI and time preference may be more intertwined than a child's BMI and his/her parent's BMI. Nevertheless these findings lead us to believe that in this context, that interventions aid individuals in overcoming their present-bias problems may not be an effective means of reducing child obesity.

[13] See Courtemanche et al. (2011) for a discussion of this relationship in the United States.

[14] We follow the wording and setup of the time preference questions in Ashraf et al. (2006). For exact wording of our questions, see the Appendix.

III Results

A Empirical Strategy

To estimate the effect of our treatment on our outcomes of interest, we first estimate regressions of the following form:

$$Y_{ig} = \beta_0 + \beta_1 * T_{ig} + \delta_g + \epsilon_{ig} \tag{1}$$

where i indexes the individual, g indexes the stratification group, Y_{ig} is an outcome of interest (e.g., caretaker concern about child's weight), T_{ig} is a treatment indicator equal to 1 if the child is assigned to one of the three treatment groups and 0 if the child belongs to the control group, δ_g is the strata fixed effect, and ϵ_{ig} is the error term. We estimate heteroskedastic-consistent standard errors.

We are also interested in discerning how the effect of the report card varies across the different treatment groups. To this end, we estimate the following:

$$Y_{ig} = \beta_0 + \beta_1 * BASIC_{ig} + \beta_2 * RISK_{ig} + \beta_3 * COMPARE_{ig} + \delta_g + \epsilon_{ig} \tag{2}$$

where $BASIC_{ig}$, $RISK_{ig}$, and $COMPARE_{ig}$ are each treatment indicators equal to 1 if the child is assigned to that treatment group respectively and 0 otherwise.

Before discussing our main set of estimates, since many of our outcome measures are survey-based, it is important to understand the extent of selection bias. In Appendix Table 2, we present estimates of the relationship between post-survey completion and treatment status. Roughly 65% of parents who completed the baseline survey completed the follow-up survey.[15] These response rates are comparable to other studies using school-based samples (Angrist et al., 2002; Bettinger and Slonim, 2007). Overall, we estimate no statistically-

[15] 80% of respondents are the same in the baseline and endline survey. Our results are similar if we only consider the sample where the respondent does not change across the two surveys.

significant effects of being assigned to treatment on post-survey completion. If anything, caretakers of children in the treatment groups were less likely to respond to the post-survey. Looking at the treatments separately, the BASIC treatment individuals had a statistically-significant lower response rate than the control group individuals, but this difference is sensitive to the inclusion of controls such as parental concern about child's weight and performance in school (two of the variables that were nearest to imbalance in the baseline survey). A priori it is difficult to assess how the lower response rate among the treated would impact our estimates. As a robustness check, we re-estimated all of our treatment regressions accounting for selection assuming selection on observables. To do so, we first estimated via a logit regression the probability of completing the post-survey as a function of school fixed effects, caretaker education, and child sex. Then, to control for the selection, we included a third-order polynomial of the predicted probabilities in our treatment regressions. These estimates are nearly identical to those presented later.[16]

B Base Treatment Results

Table 6 presents our base treatment effect estimates, overall (Panel A) and separately for male and female children (Panels B and C, respectively). Each estimate comes from a separate regression. The outcome measures come from several sources: the post survey, post-intervention height and weight measurements, and attendance records from the information session. The base sample consists of children whose parents filled out the baseline survey.

Before interpreting these outcomes, it is important to verify that the report cards were delivered home. Indeed parents in the treatment group report substantially higher rates of having received a report card with weight and height information about their child.[17] The

[16]Regression results are available upon request.

[17]It should be noted, however, that a non-trivial fraction of the control group reported receiving a card. Parents may have been confused about the survey question "Did you receive a report of your child's height and weight from his or her school in the last month?" and answered yes because they received an invitation to the information session. Alternatively, we speculated that the parents might be answering in regards to any of their children in the school, but when we drop those students with a sibling in the experiment, the results are quite similar.

report cards are more likely to lead to behavioral change if they change the parental misperceptions observed in Table 2. To test this, column (2) reports estimates using whether or not the parent correctly classifies the weight of the child after the intervention. The intervention did increase the proportion of parents that classify their children's weight correctly by 11 percentage points (20%).

If these weight categorizations hold no meaning for parents or parents do not care about their child's weight, it is not necessarily true that the BMI report cards will lead to changes in behavior. To test more directly parents' impressions of their children's weight, we examine whether the parents report that the child weighs too much in the endline survey given that parents frequently underreport the weight of their child.[18] We observe some weak evidence that parents in the treatment groups are more likely to believe that their child weighs too much. However, for healthy weight children, a good share of the sample, this outcome is less meaningful. Actually, for this group, we hope that the intervention does not affect parents' propensities to report that the child weighs too much. This outcome has more value for subsamples such as the obese and overweight, which we examine later. An alternative measure of parental reaction to the report cards is parental concern which ranges from 1 (least concern) to 4 (most concern). The effect of intervention on concern is small in both level and percentage terms (-0.05 or -1.5% decline) and the associated confidence interval can rule out impacts of the expected positive sign exceeding 2.4%. It is curious that we observe stronger effects on the margin of parental beliefs about the child weighing too much. One possible explanation is that absent the intervention, the level of concern among parents is high; 77.7% report 3 or 4 level of concern so it is hard to imagine being able to observe effects on this outcome. A second explanation is that the concern variable is a noisy measure, particularly because it is highly subjective.

We are next interested in whether the change in information and beliefs about one's child's weight translated into behavioral change on the part of the parents. Our number of

[18]Parents who report that their child weighs too much or much too much are classified as weighing too much.

actions taken outcome is useful in this regard. This variable is the sum of 7 dichotomous variables for the 7 different actions discussed in the description of the field experiment. The overall effects of the intervention on these actions is small - 1% increase, but there is substantial heterogeneity across the sexes in the response. Parents of boys in the treatment group report 16 percent increase in the number of actions; the effect for girls is opposite in sign and much smaller in magnitude. We examine these actions more closely in Table 6b. A priori we worried about the value of these self-reported measures of actions. As such, we use whether or not the parent attends the information class as an outcome intended to capture whether a parent makes a step towards an active change. About 20 percent of parents attended the sessions but across the three panels, there are unexpectedly negative but statistically insignificant impacts on attendance. It is possible, even parents wanted to change the physical activity and/or eating habits of their child, that parents were not inclined to attend because they felt that the session would provide little value. However, we asked in the endline survey "Would a session on practical tips for improving your child's eating habits and physical activity be of value to you and your child?" with over 94% parents saying yes in response.

Body mass index and weight are more objective outcomes measured without the possible selection effects of the survey measures but are less directly related to actions. We were worried about outlier observations in these post-intervention outcomes as the second round of height and weight measurements were done with a different team of assistants. In particular, some height and weight measurements imply unreasonable values for BMI (e.g., a BMI of 1488). We performed some trimming of the sample to adjust for this measurement error.[19]

[19]To address this issue, we dropped observations with weights exceeding the minimum and maximum weights observed with the pre-intervention measurements (16 was the minimum and 83 was the maximum). In the post-intervention period, 16 kilograms corresponds to the 0.16 percentile (i.e., only 3 observations have values below that threshold) and 83 corresponds to the 99.92 percentile (i.e., only 2 observations have values above that threshold). This will necessarily drop a few possible valid observations that were near 83 kilograms at the outset but our results are not sensitive to inclusion or exclusion. We also dropped observations for whom the weight change between the two measurements exceeded 10 kilograms (the 99.2 percentile of the distribution). We performed similar exclusions for observations based on their height measurements. We dropped students (7 in total) with heights below the minimum height observed in the pre-intervention period (111 cm) and one student with a height of 199 cm, which was an outlier by 30 cm. Finally, observations (34

We also, as a robustness check, use robust regressions, which drop outlier observations. Estimates are similar in either case.

The treatment effects for weight and BMI are perversely positive but statistically insignificant. The confidence intervals of these estimates exclude negative effects larger in magnitude than -1% and -2.4% on BMI and weight, respectively. To gauge the size of these effects, it is fruitful to compare these changes to the average changes between the pre-intervention and post-intervention period. These were -2.5% and 0.56% for BMI and weight, respectively.[20] Thus, although the gap in time between the two sets of weight and height measurements was only 4 to 5 months, students' body compositions were changing sufficiently that we might have expected to observe an effect on BMI and weight if the report card delivery induced behavioral modifications. Of course, however, the examined time period may have been too short for parents to have adequate time to alter their actions (e.g., enroll children in sports or teach children about unhealthy foods). However, the effect of the intervention might die down over time as the disseminated information becomes less salient, implying that if there are effects of the cards, their effects would be largest in the short-run.

Table 6b looks more deeply into the results displayed in Table 6 by examining the treatment effects for each of the 7 action measures. The format of the table follows that of Table 5 with the exception being that the outcomes here are different. The strongest positive effects are for the discussion of weight with family and friends and with the child himself. The report cards raise the probability of discussing of weight with either group by 8 to 9 percentage points, which is large given the base of 31 to 36 percent and is statistically significant. Interestingly, the overall effects are generated by the male sample.[21] This finding of larger effects for males holds across many of the outcomes we study. Such differential effects across sexes could be construed as discriminatory. But boys are also more likely to be obese. However, when looking at the overweight and obese sample exclusively, as we

observations) where the change in height was less than -5cm were discarded.

[20]The trends in weight are skewed; the median change is 0 whereas for BMI, the median is -2.3%

[21]Discussion of weight with the child is only outcome for which there are statistically significant different effects across gender.

discuss later, the same sex differences are observed although the difference in the effects are too imprecise for strong statistical inference. Alternatively, since the strongest differences across sexes are for the discussion variables, the results could reflect some stigma to talking to female children about their weight. Overall, given the relative inaction on actions more directly related to weight (e.g., the outcomes in columns (3)-(7)), our results suggest that the dissemination of BMI cards do not result in important changes to parental behaviors. The negligible treatment effect for putting a child on a diet dampens the often-mentioned public worry that the BMI report cards do more harm than good.[22]

The target population for the BMI report cards is the obese and overweight. Table 7 and 7b are tables analogous to Tables 6 and 6b except the sample is overweight and obese children, as defined by their pre-intervention measures. The effects are often less precise, so we need to be careful about making strong inferences from the results. The card receipt is more salient for this subsample, nearly all report receiving the card. There are also statistically-significant positive impacts on correctly classifying the child's weight (a 15 percentage point or 50% effect) and on reporting that the child weighs too much (a 12 percentage point or 20% effect). Interestingly, the treatment effect on the action outcome is smaller than that in Table 6, and there are no statistically-significant effects for any of the actions as seen in Table 7b. The sex differences are also fascinating, particularly because the treatment effects for many of the outcomes are of opposite sign across the sexes but none of the estimates are statistically different between boys and girls. For instance, there are sizable positive effects on attendance of the information class for girls - nearly 10 percentage points and statistically significant at the 10% level while for boys, there is a small negative effect. The overall BMI results are consistent with, at best, small reductions in BMI. The 95% confidence interval excludes effects more negative than -0.38, which is small relative to the average BMI change from the pre-intervention to the post-intervention period (-0.82). On the other hand, while the treatment effect for weight is small (0.12 kilograms), the estimate is imprecise enough

[22]This non-result holds when looking at the non-obese, non-overweight sample.

that the confidence interval spans economically meaningful effect sizes, especially given the average change between the baseline and endline survey was -0.18 kilograms for this group.

C Results by Treatment Type

So far we have considered each of the treatments together, because they are all provide the same base information (e.g., weight and height along the weight ranges for each of the weight categorizations). Tables 8 and 9 present effect estimates by treatment type (BASIC, RISK, and COMPARE) - effectively estimates of equation (2). Ex ante, we expected that RISK treatment to have a stronger effect than the BASIC treatment because relaying the health risks of behavior would make them more salient to parents. On the other hand, a recent economics and psychology literature argues that people often suffer from limited attention.[23] This phenomenon implies that the provision of additional information could be distracting to people, as people have limited ability to process information. If this effect dominates, we might observe that the BASIC treatment to be the most powerful of the three treatments. As for the COMPARE treatment, the effects could go in either direction. If many of the children in the class are overweight or obese, the COMPARE treatment may not impact behavior much because the norm is overweight/obese. In contrast, if few classmates have high BMIs, the report card information may be more prominent to parents. This implies that the effects of this treatment may be predictably heterogenous, a possibility we investigate later. Even more than the RISK treatment, the problems of limited attention may impact the effects of this treatment because people might not understand distributions.

Looking at the results, there is some heterogeneity across the different report cards but none of the differences are statistically distinguishable from one another. At least on the dimensions of received card, classify correctly, and weighing too much, the BASIC treatment effects exceed those of the other two treatments across both Tables 7 and 8. The limited attention explanation may hold then, particularly because the parents in our study

[23] See, for instance, DellaVigna (2009); Lacetera et al. (2011).

population have low levels of education (only 30% have completed high school). But the possible differential effects appear to be too small to distinguish with the sample at hand. For example, to distinguish the 0.03 differential rate in reporting that the child weighs too much among the BASIC treatment relative to the COMPARE treatment from 0, we would need a sample nearly 5 times as large.

D Regression Discontinuity Estimates

In principle, there is regression discontinuity embedded within the experimental design. Specifically, we could test the effect of a child being classified as overweight as opposed to a healthy weight by comparing children on either side of the overweight weight threshold. For instance, for a 10 year old female who is 134 cm, a weight exceeding 36 or more kilograms would classify her as overweight. We have estimated such models but do not present them here. The best regression discontinuity designs have lots of data at hand, especially near the relevant threshold, which unfortunately do not. The estimates suggest that moving across the overweight threshold for the treatment group increases the probability of the parent reporting that the child weighs too much by over 20 percentage points. This effect is not observed for the control group as expected. The regression discontinuity estimates for other outcomes are not statistically different from 0.

E Interesting Heterogeneity

i Effects by Parental Education

At its basic level, our intervention is an informational intervention. Hence, it is natural to believe that the effects of the intervention differ by parental education. For instance, educated parents may be more informed about their child's weight - leading them to respond less strongly to the report cards. Although going against this hypothesis is the fact that misclassification rates are increasing with parental education, even conditional on weight

status. The effects could be increasing in parental education if some of the information is too complex (particularly the compare treatment). In Table 10, we present the treatment effects allowing for treatment effect heterogeneity by education. We examine the overall effects in the top panel and the effects of the overweight and obese in the bottom panel. The treatment effect estimate is the estimate for children whose parent has less than a high school education and the other effects represent the additional treatment effect for that educational group relative to the less than a high school education. Interestingly, the effects for the more educated on the margins of receiving the card and being able to correctly classify the child's weight are negative, meaning that the treatment effects are smaller amongst the more educated. We do not want to overinterpret these differences as only one of them is statistically significant, but it might be that low-educated parents are more likely to pay attention to information delivered from the schools. The most interesting of the results in Table 10 is for the actions variable. The number of actions is increasing with parental education. This may suggest that part of the reason we observe no overall effect on behavioral change is that to take actions to address a child's weight issues requires resources of which the more educated have more.

ii Effects of Norms

Ex ante, we suspected that the impact of the COMPARE treatment to be a decreasing function of the fraction of children who are overweight/obese in the class. If the norm is overweight/obese then the report card may cause parents to be less worried about their child's weight than if the norm is not. In Table 11, we test these predictions. The format of the table follows of that Table 9 where we present separate estimates for the obese and overweight and the overall sample. Since the fraction of obese/overweight in each class is not randomized, any differences we find along that dimension may indeed be attributable to the fraction obese/overweight in the class but also due to other factors that are correlated with this fraction. Thus, we included grade x school fixed effects; the results are similar with

and without these controls. We estimate the regressions in Table 11 focusing exclusively on the control and COMPARE treatment subsamples.

For the overall sample, the effects are less clear. This finding is not surprising. For instance, the behaviors of a parent of a healthy weight child may not be impacted by the fraction of the class that is overweight or obese. Among the overweight/obese, the parents of children in the more overweight/obese classrooms report higher rates of receiving the report card, perhaps because the information of the card resonated more with them. Beliefs about weighing too much is strongly negative related to overweight/obesity rates in the class as expected. Such a pattern does not appear if we use the baseline measure of this dependent variable. This result supports the findings of Ali et al. (2011) who argue that the obesity rates of peers affect one's own weight perceptions.

F Possible Cross-Treatment Contamination Effect

The randomization at the child level left open the possibility that there were spillover effects across the different treatments. One could imagine that spillovers could be larger among families where one or more children participated in the experiment. As such, we re-estimated the regressions from Table 6 on the sample of families with no other children in the experiment. We present these new results in Appendix Table 3. In general, the magnitudes of the estimates are similar. For example, the overall estimate for correctly classifying your child's weight in Table 6 is 0.114 whereas among the sample considered in Appendix Table 3, it is 0.099. These results give us some confidence that cross-contamination effects are not severely biasing our estimates.

G Relation to Previous Work on the Effect of Report Cards

Our work is related to an earlier public health and medical literature on BMI report cards (Chomitz et al., 2003; Grimmett et al., 2008; Kalich et al., 2008; Kubik et al., 2006). With the exception of Chomitz et al. (2003), the cited papers use a pre-post research design with

often a highly-selected sample.[24] Chomitz et al. (2003) uses a randomized-controlled design. These studies use smaller sample sizes involving fewer schools and examine the effects of a basic report card (i.e., they do not investigate whether effects differ by the content of the information provided.[25] Also, they focus on developed countries - the United Kingdom and the United States.

Nevertheless, it is informative to compare our results to theirs. Fortunately, these earlier studies informed many of the survey questions we asked, and thus, a direct comparison of our results with theirs is possible. One clear contrast that emerges is that the degree of misclassification of weight status is more severe in Mexico. In Chomitz et al. (2003), using a population of Cambridge, Massachusetts schoolchildren, report that 16% of parents with an obese child misreport their child's weight status compared to 6% here.[26] The report cards exhibit a stronger effect among the obese in Mexico than in Cambridge - a 14 percentage point shift in Mexico and 9 percentage point change in Cambridge. Educational differences across the two areas are a likely explanation. Like our study, Chomitz et al. (2003) shows no effect of the cards on parental concern even though 23% of parents report concern about their child's weight in the Cambridge study whereas we find 82% of parents do.

In many cases, the new knowledge translates into behavioral changes. Chomitz et al. (2003) that among both overweight/obese and healthy weight that parents receiving report cards are more likely to engage in weight-modifying behaviors for their children including physical activity and dieting. Similarly, Kalich et al. (2008) find that overweight students are more likely to report the intention of visiting a doctor, eating more fruits and vegetables and increasing physical activity. Finally, Grimmett et al. (2008) find little change in reported behavior.

It is interesting then to understand why these studies often find behavioral modifications

[24]For example, Grimmett et al. (2008) use a sample of volunteer parents who were willing to allow researchers to take weight and height measurements and receive feedback. Rates of participation were low - 46%.

[25]Chomitz et al. (2003) which considers 1131 participants, has the largest sample.

[26]Rates of misclassification among the obese are lower in the UK study of Grimmett et al. (2008). Over 40% of parents correctly report that their child is overweight.

when we do not. One possible explanation is that Mexican families do not have the resources to adopt healthy habits as families in the UK and US do. The results from Table 10 are consistent with this; action rates are highest among the most educated.

IV Discussion and Conclusion

In this paper, we study how information affects behavior. Specifically, we study the effect of body mass index report card on parents' behaviors and children's outcomes. Relative to many other childhood obesity policies (e.g., physical activity classes), this intervention holds an advantage in that it is low-cost and easily scaled up. We find that the body mass index report cards led to changes in parental perceptions about their children's weight. According to models of health behavioral change such as the canonical Health Belief Model (Hochbaum et al., 1952), a necessary pre-requisite for behavioral modification is an understanding of one's risk of disease. In our case, this implies that obesity policies may only be effective if people are cognizant of the risks of obesity and their own obesity status. But, if people do not understand or care about their susceptibility to obesity and its risks, the many paternalistic obesity policies (e.g., soft drink taxes, the banning of trans-fat foods) may have unintended consequences. As an example, an increase in soft drink taxes leads to the consumption of other high calorie beverages (Fletcher et al., 2010).

The type of information contained on these report card is likely to be quite important although our results are less powered to make definite conclusions in this regard. We do find that parental perceptions about their child's obesity problems are impacted by peer obesity problems. In particular, the more obese/overweight a class is, the less likely a parent is to report an overweight/obese children as weighing too much. This implies that as obesity rates rise, it may be more and more difficult to induce behavioral change because obesity is less of an outlier behavior.

The puzzling finding of the paper is why when parents were more aware of their child's

weight status, we did not observe many meaningful impacts on behaviors. There are many explanations for this finding - most of which we are not able to rule out. First, parents could believe that childhood obesity has little relevance for adult obesity. However, treatment group parents whose child is either overweight or obese are more likely to believe that their child weighs too much than analogous control group parents. Second, in developing countries, parents have many concerns and limited resources to address them and obesity is not high on the list of concerns. Supporting this argument, in Table 1, we observe parent's concern about several issues - H1N1, child's weight, and child's performance in school. Child's weight is at the bottom of that list of concerns. Third, the risks of obesity may not yet be particularly salient, especially in a society that has recently battled problems of underweight. It is possible that once parents become more aware of the risks of obesity, we will see more of them taking a pro-active step to reduce childhood obesity, and moreover, the rates of misinformation we observe may be lower in the future. Fourth, parents may not have either the income or the knowledge about how to decrease the incidence of childhood obesity. A healthy diet is often more expensive (Monsivais et al., 2011). By itself, information is simply not enough to induce to change in this context. This finding is consistent with earlier work that information alone is not enough. For instance, this is true for the effect of caloric information on diet (Jayachandran and Cawley, 2006). For future research, it would be interesting to address whether this information coupled with an action plan for inducing change would change people's behaviors. While recent health research in development economics indicates that the provision of information can impact condom use, malaria treatment, and the treatment of drinking water (see Dupas (2011b) for an excellent review), more research needs to be done to understand how, why, and when such information is effective.

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Figure 1: Distribution of Post-Intervention Parental Attitudes about Child's Weight

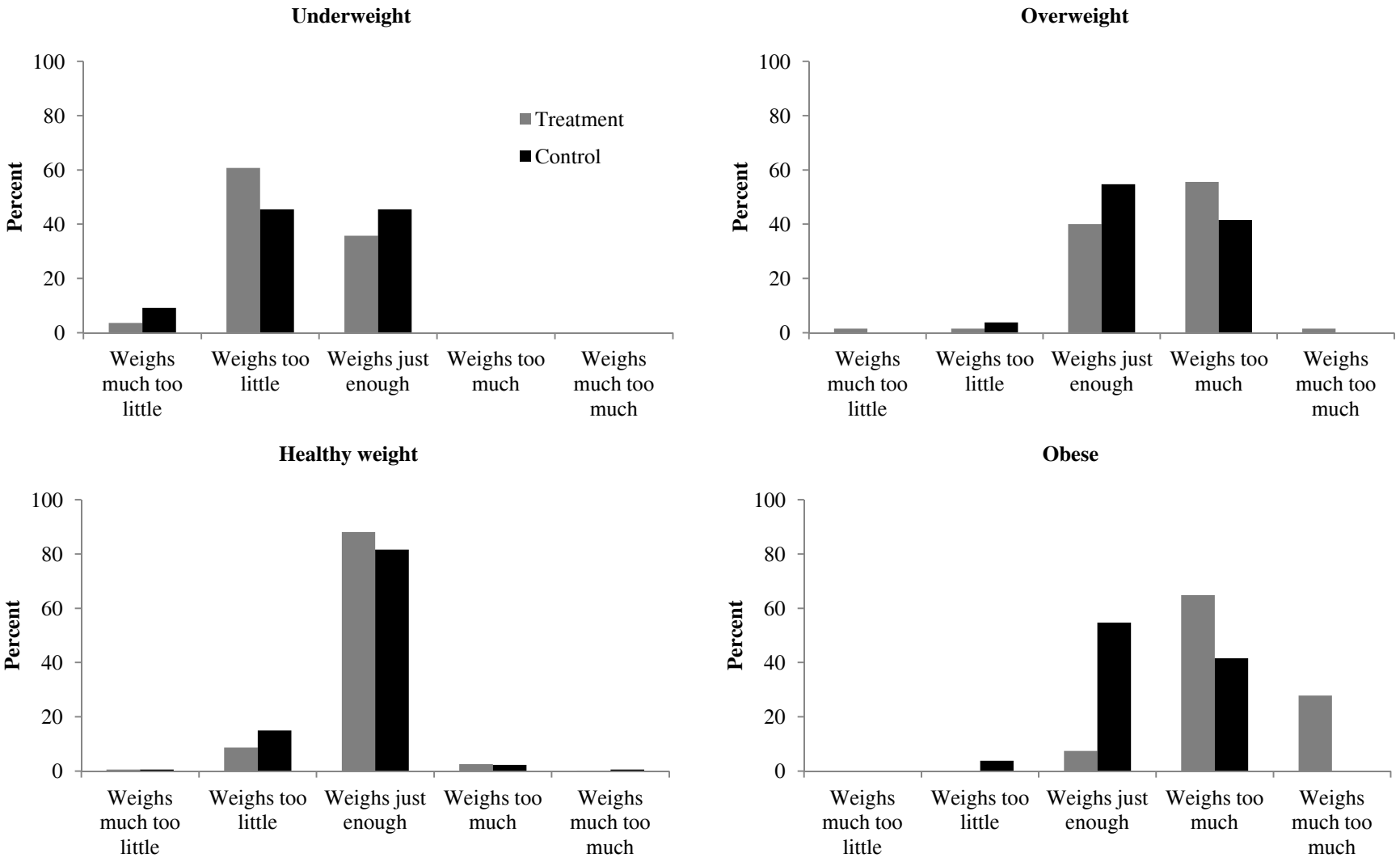

Table 1: Pre-Treatment Characteristics

	Mean				P-value	
	Control	**Basic**	**Risk**	**Compare**	**Treatment=Control**	**All equal**
Panel A: Child Measurement						
	N=673	*N=702*	*N=680*	*N=691*		
BMI	18.11	18.34	18.36	18.29	0.16	0.06
	[3.44]	[3.53]	[3.45]	[3.35]		
Fraction Underweight	0.03	0.03	0.03	0.03	NA	NA
Fraction Healthy weight	0.68	0.66	0.67	0.67	NA	NA
Fraction Overweight	0.17	0.18	0.17	0.18	NA	NA
Fraction Obese	0.12	0.13	0.12	0.13	NA	NA
Panel B: Survey Responses by Primary Caretaker						
	N=499	*N=508*	*N=505*	*N=518*		
Less than High School	0.34	0.38	0.33	0.31	0.16	0.92
High School	0.42	0.41	0.42	0.45	0.58	0.99
More than High School	0.23	0.21	0.26	0.24	0.45	0.85
Concern about H1N1 (Ranges 1-4)	3.27	3.22	3.25	3.25	0.76	0.54
	[0.79]	[0.78]	[0.81]	[0.79]		
Concern about child's weight (1-4)	3.16	3.10	3.01	3.08	0.07	0.04
	[0.95]	[0.98]	[1.00]	[0.98]		
Concern about own weight (1-4)	3.06	3.03	2.98	3.03	0.59	0.35
	[0.97]	[0.98]	[0.99]	[0.94]		
Concern about child's school performance (1-4)	3.71	3.67	3.63	3.62	0.06	0.01
	[0.58]	[0.67]	[0.67]	[0.68]		
Other children in experiment (1=Yes, 0=No)	0.30	0.29	0.27	0.28	0.50	0.25

Notes: Table presents means and standard deviations in brackets for continuous variables.

Table 2: Parental Classification versus Actual Classification of Weight Status

	Parental Classification				
Actual Classification	Underweight	Healthy weight	Overweight	Obese	Don't know
Underweight	27 (41%)	38 (58%)	0 (0%)	1 (2%)	0 (0%)
Healthy weight	205 (15%)	1090 (82%)	32 (2%)	0 (0%)	7 (1%)
Overweight	2 (<1%)	240 (66%)	113 (33%)	1 (<1%)	6 (2%)
Obese	0 (0%)	52 (20%)	189 (74%)	14 (5%)	2 (1%)

Notes: Table shows the count in each category. Percentages in parentheses represent percentages for each row.

Table 3: Actual Classification of Weight Status versus Parental Beliefs about Weight

	Primary caretaker's characterization of child's weight					
Actual Classification	Don't know	Weighs much too little	Weighs too little	Weighs just enough	Weighs too much	Weighs much too much
Underweight	0 (0%)	5 (8%)	22 (34%)	38 (58%)	0 (0%)	0 (0%)
Healthy weight	8 (1%)	11 (1%)	189 (14%)	1093 (82%)	33 (2%)	0 (0%)
Overweight	6 (2%)	0 (0%)	2 (1%)	235 (65%)	118 (33%)	1 (<1%)
Obese	1 (<1%)	0 (0%)	1 (<1%)	55 (21%)	180 (70%)	20 (8%)

Notes: Table shows the count in each category. Percentages in parentheses represent percentages for each row.

Table 4: Cross-Sectional Correlations Between Weight Status & Parental Education

	Weight Status at Baseline		
	Underweight	**Overweight**	**Obese**
	(1)	(2)	(3)
Parental Education			
Less than High School	0.001	-0.034	-0.060
	(0.009)	(0.019)	(0.016)**
High School	-0.005	-0.000	-0.042
	(0.010)	(0.023)	(0.019)*
Male	-0.014	0.012	0.073
	(0.008)	(0.017)	(0.015)**
Observations	2042	2046	2046
Dep Var Mean	0.03	0.18	0.13

Notes: Robust standard errors are presented in parentheses. * denotes statistical significance at the 5% level ** at the 1% level. Greater than high school is the excluded category.

Table 5: Cross-Sectional Correlations Between Weight Status & Time Inconsistency

	Weight at Baseline			
	BMI	**Underweight**	**Overweight**	**Obese**
	(1)	(3)	(5)	(7)
Time Inconsistent	-0.217	0.004	0.001	-0.034
	(0.187)	(0.011)	(0.024)	(0.018)
Observations	1565	1565	1565	1565
Dep Var Mean	18.25	0.03	0.18	0.12

Notes: Robust standard errors are presented in parentheses. * denotes statistical significance at the 5% level ** at the 1% level. These regressions control for school fixed effects, caretaker respondent education level, child sex, and child's age in month fixed effects.

Table 6: Overall Effects of Treatment on Behavior & BMI

	Received card?	Classify child's weight correctly	Child weighs too much?	Concern about child's weight	Number of actions taken	Whether attended information class	BMI	Weight
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Overall								
Treatment	0.429	0.114	0.034	-0.050	0.074	-0.024	0.067	0.019
	(0.031)**	(0.028)**	(0.020)	(0.063)	(0.079)	(0.020)	(0.123)	(0.436)
Observations	1115	1102	1088	1138	1125	1831	1653	1653
Dep Var Mean	0.46	0.63	0.20	3.23	1.53	0.19	17.72	34.53
Panel B: Boys								
Treatment	0.402	0.091	0.052	-0.071	0.246	-0.035	0.049	-0.135
	(0.045)**	(0.039)*	(0.024)*	(0.090)	(0.115)*	(0.028)	(0.166)	(0.612)
Observations	526	520	517	536	531	887	788	788
Dep Var Mean	0.50	0.60	0.22	3.30	1.52	0.20	17.94	34.93
Panel C: Girls								
Treatment	0.470	0.136	-0.006	-0.011	-0.071	-0.016	0.073	0.216
	(0.044)**	(0.041)**	(0.029)	(0.089)	(0.108)	(0.029)	(0.182)	(0.618)
Observations	589	582	571	602	594	944	865	865
Dep Var Mean	0.43	0.65	0.19	3.18	1.53	0.18	17.52	34.14

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The dependent variable mean is the mean for the control group. The possible actions undertaken by parents are: discussed weight with family/friends, discussed child's weight with him/her, seen doctor in regards to weight, put child on a diet, had child skip meals, encourage child to increase physical activity, and sign child up for sport/exercise class.

Table 6b: Overall Effects of Treatment on Reported Actions Undertaken by Parents

	Discussed weight with family/friends	Discussed child's weight with him/her	Seen doctor in regards to weight	Put child on a diet	Had child skip meals	Encouraged child to increase physical activity	Signed child up for sport/exercise class
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Overall							
Treatment	0.084	0.087	-0.001	-0.017	-0.025	-0.018	-0.037
	(0.032)**	(0.032)**	(0.025)	(0.013)	(0.016)	(0.032)	(0.025)
Observations	1125	1125	1125	1125	1125	1125	1125
Dep Var Mean	0.31	0.36	0.15	0.04	0.07	0.42	0.17
Panel B: Boys							
Treatment	0.098	0.170	0.006	0.001	-0.030	0.031	-0.030
	(0.048)*	(0.044)**	(0.038)	(0.019)	(0.024)	(0.046)	(0.039)
Observations	531	531	531	531	531	531	531
Dep Var Mean	0.33	0.33	0.16	0.04	0.08	0.40	0.19
Panel C: Girls							
Treatment	0.066	0.006	-0.009	-0.032	-0.016	-0.052	-0.034
	(0.045)	(0.046)	(0.033)	(0.018)	(0.023)	(0.046)	(0.033)
Observations	594	594	594	594	594	594	594
Dep Var Mean	0.29	0.40	0.14	0.05	0.07	0.45	0.15

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The dependent variable mean is the mean for the

Table 7: Effects of Treatment on Behavior & BMI among Overweight & Obese

	Received card?	Classify child's weight correctly	Child weighs too much?	Concern about child's weight	Number of actions taken	Whether attended information class	BMI	Weight
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Overall								
Treatment	0.504	0.154	0.119	0.042	0.032	0.025	0.145	0.120
	(0.055)**	(0.055)**	(0.056)*	(0.105)	(0.183)	(0.041)	(0.266)	(0.950)
Observations	338	336	328	345	341	546	506	506
Dep Var Mean	0.39	0.30	0.59	3.37	2.24	0.21	21.52	43.28
Panel B: Boys								
Treatment	0.516	0.172	0.105	0.004	0.181	-0.038	0.312	0.953
	(0.075)**	(0.071)*	(0.068)	(0.130)	(0.245)	(0.055)	(0.346)	(1.207)
Observations	186	188	185	193	190	303	275	275
Dep Var Mean	0.40	0.25	0.58	3.41	2.24	0.27	21.20	41.81
Panel C: Girls								
Treatment	0.517	0.090	0.071	0.082	-0.123	0.096	-0.218	-1.112
	(0.084)**	(0.090)	(0.096)	(0.174)	(0.276)	(0.058)	(0.430)	(1.521)
Observations	152	148	143	152	151	243	231	231
Dep Var Mean	0.38	0.37	0.61	3.32	2.24	0.13	21.99	45.44

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The dependent variable mean is the mean for the control group. The possible actions undertaken by parents are: discussed weight with family/friends, discussed child's weight with him/her, seen doctor in regards to weight, put child on a diet, had child skip meals, encourage child to increase physical activity, and sign child up for sport/exercise class.

Table 7b: Effects of Treatment on Reported Actions Undertaken by Parents among Obese & Overweight

	Discussed weight with family/friends	Discussed child's weight with him/her	Seen doctor in regards to weight	Put child on a diet	Had child skip meals	Encouraged child to increase physical activity	Signed child up for sport/exercise class
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Overall							
Treatment	0.062	0.073	0.066	-0.040	-0.071	-0.069	0.010
	(0.062)	(0.060)	(0.045)	(0.037)	(0.044)	(0.059)	(0.048)
Observations	341	341	341	341	341	341	341
Dep Var Mean	0.41	0.56	0.14	0.11	0.18	0.66	0.19
Panel B: Boys							
Treatment	0.094	0.145	0.042	0.019	-0.066	-0.042	-0.010
	(0.087)	(0.082)	(0.063)	(0.047)	(0.057)	(0.080)	(0.069)
Observations	190	190	190	190	190	190	190
Dep Var Mean	0.43	0.54	0.15	0.07	0.17	0.67	0.22
Panel C: Girls							
Treatment	0.034	-0.025	0.066	-0.111	-0.068	-0.074	0.055
	(0.095)	(0.093)	(0.071)	(0.066)	(0.073)	(0.094)	(0.067)
Observations	151	151	151	151	151	151	151
Dep Var Mean	0.38	0.59	0.14	0.16	0.19	0.65	0.14

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The dependent variable mean is the mean for the control group.

Table 8: Overall Effects of Treatment on Behavior & BMI

	Received card?	Classify child's weight correctly	Child weighs too much?	Concern about child's weight	Number of actions taken	Whether attended information class	BMI	Weight
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Overall								
BASIC Treatment	0.458	0.138	0.045	-0.008	0.086	-0.040	0.158	0.211
	(0.034)**	(0.034)**	(0.024)	(0.079)	(0.096)	(0.024)	(0.148)	(0.517)
RISK Treatment	0.408	0.094	0.044	-0.078	0.133	-0.006	0.106	0.163
	(0.036)**	(0.033)**	(0.023)	(0.077)	(0.095)	(0.025)	(0.145)	(0.527)
COMPARE Treatment	0.424	0.112	0.015	-0.062	0.000	-0.026	-0.066	-0.325
	(0.035)**	(0.033)**	(0.023)	(0.077)	(0.095)	(0.025)	(0.149)	(0.533)
Observations	1115	1102	1088	1138	1125	1831	1653	1653
Dep Var Mean	0.46	0.63	0.20	3.23	1.53	0.19	17.73	34.53
Panel B: Boys								
BASIC Treatment	0.449	0.126	0.069	-0.086	0.260	-0.075	0.224	-0.026
	(0.050)**	(0.049)*	(0.034)*	(0.119)	(0.153)	(0.033)*	(0.216)	(0.751)
RISK Treatment	0.394	0.073	0.042	-0.118	0.215	0.003	-0.023	-0.022
	(0.050)**	(0.047)	(0.029)	(0.111)	(0.138)	(0.036)	(0.198)	(0.740)
COMPARE Treatment	0.372	0.081	0.048	-0.010	0.266	-0.034	-0.033	-0.338
	(0.051)**	(0.048)	(0.031)	(0.110)	(0.136)	(0.035)	(0.196)	(0.737)
Observations	526	520	517	536	531	887	788	788
Dep Var Mean	0.50	0.60	0.22	3.30	1.52	0.20	17.94	34.93
Panel C: Girls								
BASIC Treatment	0.487	0.155	-0.003	0.076	-0.110	-0.013	0.083	0.401
	(0.047)**	(0.048)**	(0.035)	(0.107)	(0.128)	(0.034)	(0.208)	(0.714)
RISK Treatment	0.438	0.125	0.030	0.002	0.072	-0.015	0.194	0.291
	(0.051)**	(0.047)**	(0.034)	(0.109)	(0.130)	(0.035)	(0.213)	(0.749)
COMPARE Treatment	0.486	0.128	-0.050	-0.121	-0.189	-0.020	-0.070	-0.077
	(0.048)**	(0.046)**	(0.032)	(0.110)	(0.128)	(0.035)	(0.228)	(0.774)
Observations	589	582	571	602	594	944	865	865
Dep Var Mean	0.43	0.65	0.19	3.18	1.53	0.18	17.52	34.14

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The dependent variable mean is the mean for the control group. The possible actions undertaken by parents are: discussed weight with family/friends, discussed child's weight with him/her, seen doctor in regards to weight, put child on a diet, had child skip meals, encourage child to increase physical activity, and sign child up for sport/exercise class.

Table 9: Effects by Treatment Type on Behavior & BMI among Obese and Overweight

	Received card?	Classify child's weight correctly	Child weighs too much?	Concern about child's weight	Number of actions taken	Whether attended information class	BMI	Weight
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Overall								
BASIC Treatment	0.539	0.236	0.133	-0.011	0.095	0.031	0.378	0.656
	(0.058)**	(0.068)**	(0.067)*	(0.128)	(0.224)	(0.050)	(0.321)	(1.133)
RISK Treatment	0.524	0.104	0.136	0.046	0.049	-0.000	0.148	0.085
	(0.062)**	(0.068)	(0.066)*	(0.130)	(0.228)	(0.050)	(0.307)	(1.109)
COMPARE Treatment	0.450	0.120	0.087	0.095	-0.050	0.042	-0.085	-0.370
	(0.064)**	(0.069)	(0.067)	(0.119)	(0.220)	(0.050)	(0.319)	(1.144)
Observations	338	336	328	345	341	546	506	506
Dep Var Mean	0.39	0.30	0.59	3.37	2.24	0.21	21.52	43.28
Panel B: Boys								
BASIC Treatment	0.590	0.245	0.103	-0.101	0.104	-0.085	0.750	1.587
	(0.075)**	(0.095)*	(0.084)	(0.176)	(0.332)	(0.067)	(0.443)	(1.489)
RISK Treatment	0.539	0.105	0.113	-0.004	0.010	-0.040	-0.078	0.213
	(0.083)**	(0.091)	(0.084)	(0.164)	(0.294)	(0.068)	(0.405)	(1.414)
COMPARE Treatment	0.429	0.172	0.098	0.106	0.407	0.008	0.281	1.064
	(0.088)**	(0.092)	(0.084)	(0.147)	(0.286)	(0.069)	(0.407)	(1.485)
Observations	186	188	185	193	190	303	275	275
Dep Var Mean	0.40	0.25	0.58	3.41	2.24	0.27	21.20	41.81
Panel C: Girls								
BASIC Treatment	0.503	0.200	0.094	0.063	-0.057	0.170	-0.222	-0.784
	(0.093)**	(0.108)	(0.118)	(0.199)	(0.331)	(0.077)*	(0.485)	(1.761)
RISK Treatment	0.544	0.084	0.143	0.179	0.090	0.030	0.098	-0.855
	(0.096)**	(0.109)	(0.110)	(0.216)	(0.351)	(0.069)	(0.481)	(1.754)
COMPARE Treatment	0.505	-0.034	-0.050	-0.005	-0.435	0.085	-0.558	-1.754
	(0.096)**	(0.111)	(0.116)	(0.202)	(0.323)	(0.072)	(0.534)	(1.844)
Observations	152	148	143	152	151	243	231	231
Dep Var Mean	0.38	0.37	0.61	3.32	2.24	0.13	21.99	45.44

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The possible actions undertaken by parents are: discussed weight with family/friends, discussed child's weight with him/her, seen doctor in regards to weight, put child on a diet, had child skip meals, encourage child to increase physical activity, and sign child up for sport/exercise class.

Table 10: Heterogenous Treatment Effects by Education

	Received card?	Classify child's weight correctly	Child weighs too much?	Concern about child's weight	Number of actions taken
	(1)	(2)	(3)	(4)	(5)
Overall Effects by Educational Level					
Treatment	0.443	0.144	0.037	-0.021	-0.024
	(0.035)**	(0.033)**	(0.022)	(0.079)	(0.095)
Treatment*High School	-0.022	-0.063	0.003	-0.004	0.180
	(0.025)	(0.030)*	(0.021)	(0.076)	(0.090)*
Treatment* More than High School	-0.011	-0.045	-0.011	-0.089	0.105
	(0.031)	(0.035)	(0.024)	(0.088)	(0.106)
Observations	1079	1066	1053	1101	1088
Dep Var Mean	0.46	0.64	0.20	3.23	1.53
Overweight/Obese Effects by Educational Level					
Treatment	0.545	0.271	0.148	0.040	-0.329
	(0.064)**	(0.076)**	(0.072)*	(0.134)	(0.263)
Treatment*High School	-0.085	-0.174	-0.046	-0.045	0.482
	(0.047)	(0.074)*	(0.065)	(0.124)	(0.240)*
Treatment* More than High School	-0.038	-0.141	-0.053	-0.002	0.545
	(0.049)	(0.079)	(0.069)	(0.141)	(0.257)*
Observations	325	324	317	332	328
Dep Var Mean	0.40	0.30	0.60	3.40	2.25

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The dependent variable mean is the mean for the control group. The possible actions undertaken by parents are: discussed weight with family/friends, discussed child's weight with him/her, seen doctor in regards to weight, put child on a diet, had child skip meals, encourage child to increase physical activity, and sign child up for sport/exercise class.

Table 11: Heterogenous Treatment Effects of COMPARE treatment

	Received card?	Classify child's weight correctly	Child weighs too much?	Concern about child's weight	Number of actions taken
	(1)	(2)	(3)	(4)	(5)
Overall Effects by Fraction Obese/Overweight in Class					
Treatment	0.368	0.319	0.212	-0.229	0.078
	(0.133)**	(0.149)*	(0.116)	(0.311)	(0.409)
Treatment*Fraction Obese/Overweight in Class	0.114	-0.719	-0.635	0.477	0.039
	(0.440)	(0.501)	(0.405)	(1.032)	(1.349)
Observations	578	575	566	594	585
Dep Var Mean	0.46	0.63	0.20	3.23	1.53
Overweight/Obese Effects by Fraction Obese/Overweight in Class					
Treatment	0.078	0.009	0.759	0.570	0.392
	(0.217)	(0.242)	(0.274)**	(0.563)	(0.972)
Treatment*Fraction Obese/Overweight in Class	1.462	0.174	-1.982	-1.546	-1.371
	(0.678)*	(0.767)	(0.919)*	(1.850)	(3.094)
Observations	171	173	168	175	173
Dep Var Mean	0.39	0.30	0.59	3.37	2.24

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The dependent variable mean is the mean for the control group. The possible actions undertaken by parents are: discussed weight with family/friends, discussed child's weight with him/her, seen doctor in regards to weight, put child on a diet, had child skip meals, encourage child to increase physical activity, and sign child up for sport/exercise class.

Appendix Table 1: Pre-Treatment Characteristics Conditional on Completion of Pre-Survey

	Mean				P-value	
	Control	**Basic**	**Risk**	**Compare**	**Treatment=Control**	**All equal**
Panel A: Child Measurement	*N=393*	*N=354*	*N=402*	*N=381*		
BMI	18.14	18.24	18.21	18.42	0.16	0.06
	[3.41]	[3.60]	[3.45]	[3.43]		
Underweight	0.03	0.03	0.04	0.03	NA	NA
Healthy weight	0.65	0.65	0.68	0.65	NA	NA
Overweight	0.19	0.19	0.16	0.17	NA	NA
Obese	0.12	0.13	0.13	0.15	NA	NA
Panel B: Survey Responses by Primary Caretak	*N=316*	*N=301*	*N=340*	*N=312*		
Less than High School	0.34	0.38	0.32	0.30	0.16	0.95
High School	0.19	0.19	0.19	0.21	0.45	0.46
More than High School	0.46	0.42	0.48	0.47	0.03	0.68
Concern about H1N1 (1-4)	3.33	3.21	3.26	3.29	0.76	0.54
	[0.78]	[0.78]	[0.79]	[0.75]		
Concern about child's weight (1-4)	3.19	3.09	3.00	3.13	0.07	0.04
	[0.92]	[1.01]	[1.00]	[0.95]		
Concern about own weight (1-4)	3.08	2.99	2.97	3.05	0.59	0.35
	[0.93]	[1.04]	[1.00]	[0.90]		
Concern about child's school performance (1-4)	3.76	3.65	3.63	3.64	0.06	0.01
	[0.55]	[0.71]	[0.70]	[0.65]		
Other children in the school (1=Yes, 0=No)	0.48	0.45	0.45	0.45	0.75	0.90

Notes: Table presents means and standard deviations in brackets for continuous variables.

Appendix Table 2: Response Rates as a Function of Treatment Conditional on Completion of Pre-Survey

	Overall	**Males**	**Females**	**Overall**	**Males**	**Females**
Sample:	All	All	All	Overweight and obese	Overweight and obese	Overweight and obese
Panel A: Combined Treatments						
Treatment	-0.025	-0.048	-0.005	-0.083	-0.104	-0.062
	(0.025)	(0.036)	(0.035)	(0.046)	(0.061)	(0.071)
Observations	1831	887	944	546	303	243
Dep Var Mean	0.64	0.63	0.65	0.69	0.70	0.69
Panel B: Separate Treatments						
BASIC Treatment	-0.062	-0.096	-0.038	-0.096	-0.130	-0.057
	(0.031)*	(0.045)*	(0.043)	(0.057)	(0.078)	(0.087)
RISK Treatment	0.029	-0.001	0.056	-0.065	-0.079	-0.051
	(0.031)	(0.044)	(0.043)	(0.056)	(0.076)	(0.086)
COMPARE Treatment	-0.039	-0.049	-0.033	-0.086	-0.102	-0.081
	(0.030)	(0.043)	(0.043)	(0.055)	(0.074)	(0.086)
Observations	1831	887	944	546	303	243
Dep Var Mean	0.64	0.63	0.65	0.69	0.70	0.69

Notes: Robust standard errors are presented in parentheses. * denotes statistical significance at the 5% level.

Appendix Table 3: Overall Effects of Treatment on Behavior & BMI for Sample of Lone Children

	Received card?	Classify child's weight correctly	Child weighs too much?	Concern about child's weight	Number of actions taken	Whether attended information class	BMI	Weight
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Overall								
Treatment	0.471	0.099	0.021	-0.019	0.073	-0.017	0.193	0.311
	(0.038)**	(0.034)**	(0.024)	(0.076)	(0.098)	(0.025)	(0.135)	(0.475)
Observations	776	769	762	793	781	1256	1139	1139
Dep Var Mean	0.42	0.64	0.22	3.22	1.57	0.18	17.60	34.23
Panel B: Boys								
Treatment	0.458	0.097	0.058	-0.033	0.223	-0.028	0.218	0.314
	(0.054)**	(0.044)*	(0.031)	(0.107)	(0.154)	(0.035)	(0.186)	(0.654)
Observations	362	360	357	369	363	592	531	531
Dep Var Mean	0.46	0.59	0.21	3.31	1.59	0.20	17.86	34.70
Panel C: Girls								
Treatment	0.494	0.103	-0.039	0.036	-0.041	-0.008	0.166	0.449
	(0.054)**	(0.052)*	(0.036)	(0.109)	(0.131)	(0.035)	(0.197)	(0.679)
Observations	414	409	405	424	418	664	608	608
Dep Var Mean	0.38	0.69	0.23	3.13	1.55	0.17	17.35	33.78

Notes: Robust standard errors are presented in parentheses. * and ** denote statistical significance at the 5% and 1% level, respectively. The dependent variable mean is the mean for the control group. The possible actions undertaken by parents are: discussed weight with family/friends, discussed child's weight with him/her, seen doctor in regards to weight, put child on a diet, had child skip meals, encourage child to increase physical activity, and sign child up for sport/exercise class.