NBER WORKING PAPER SERIES

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Working Paper 19344
http://www.nber.org/papers/w19344

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
August 2013

For useful comments, we thank Emily Breza, Mac Brown, Kitt Carpenter, Mariana Carrera, Carlos Chiapa, David Clingingsmith, Pascaline Dupas, Silke Forbes, Mireille Jacobson, Laura Juarez, Peter Kuhn, Paco Martorell, Paulina Oliva, Justin Sydnor, and Mark Votruba. We also appreciate the suggestions and thoughts of seminar participants at Case Western Reserve University, Cornell University, El Colegio de México, and the University of California-Santa Barbara and conference attendees at the American Society of Health Economists 2010 Conference, Mind the Gap: From Evidence to Policy Impact 2011 Conference, and the 2011 Advances in Field Experiments Conference at the University of Chicago. This research would not have been possible without the outstanding work of Janine Kaiser who served as our project coordinator. We also thank Ashley Pierson for valuable help at the start of the project, Allison Bauer for research assistance, and the Russell Sage Foundation for generous research support. Royer thanks the RAND Corporation for hosting her during the completion of the project. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

At least one co-author has disclosed a financial relationship of potential relevance for this research. Further information is available online at http://www.nber.org/papers/w19344.ack

The Importance of Parental Knowledge and Social Norms: Evidence from Weight Report Cards in Mexico

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NBER Working Paper No. 19344
August 2013
JEL No. I12,I18,O54

ABSTRACT

The rise of childhood obesity in less developed countries is often overlooked. We study the impact of body weight report cards in Mexico. The report cards increased parental knowledge and shifted parental attitudes about children's weight. We observe no meaningful changes in parental behaviors or children's body mass index. Interestingly, parents of children in the most obese classrooms were less likely to report that their obese child weighed too much relative to those in the least obese classrooms. As obesity rates increase, reference points for appropriate body weights may rise, making it more difficult to lower obesity rates.

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I Introduction

The incidence of childhood obesity has risen dramatically in both developed and developing countries. While the tripling of rates of childhood obesity in the United States over the last 30 years has garnered much attention (Centers for Disease Control, 2011), the recent trends in developing countries have received less emphasis although their trends are often more stark. In several developing countries, both the rate of growth of childhood obesity and the level of childhood obesity exceed those of developed countries (World Bank, 2011; World Health Organization, 2012). Mexico, the country we study, is a prime example. Mexico has one of the highest obesity rates in the world (El Universal, January 22, 2010) and is on a trajectory to surpass obesity rates in the United States.[1] Despite these patterns, there have been very few economics studies on obesity in developing countries.[2]

Statistics like these trigger widespread concern because childhood obesity is associated with many adverse outcomes. Obese children face 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; Must et al., 1999; Must and Strauss, 1999). They are also more likely to be obese as adults (Dietz, 1998). As such, the rapid increase in obesity rates at young ages will likely have implications for human capital formation, adult health, labor market opportunities and other socioeconomic outcomes (Cawley, 2004; Daniels, 2006; Taras and Potts-Datema, 2005). In addition, there is some evidence that early interventions are more cost-effective than later interventions (Heckman, 2006). As evidence towards this point, Conti and Heckman (2012) show that an early intervention that moves a child's health from the bottom to the top of the health distribution decreases his/her probability of being obese at age 30 by 20 percentage points,

[1] In Mexico in 1999, 5.3 percent of male children and 5.9 percent of female children were obese and, in 2006, those percentages were 10.8 percent and 9 percent, respectively (Olaiz et al., 2006). Data on the heights and weights of Mexican school-aged children are only available for more recent years. Rates in the U.S. 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`.

[2] Exceptions include Luo et al. (2006); Bhalotra and Rawlings (2011).

affirming that tackling issues of obesity early in life may have dramatic long-run effects.

There has been much discussion about what policies may counteract these changes. Across the developing and developed world, popular proposals include removing vending machines from schools, banning food vendors on school property, 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. Information interventions may be less intrusive but yet powerful alternatives. Certainly, within other domains, information interventions have been effective in changing behavior.[3] In fact, many health and 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 predicated on the idea that information could affect behavior.

We evaluate the effect of a tailored information intervention—the delivery of body weight report cards to parents using a randomized-controlled design within Mexico. The fast-growing rate of childhood obesity there along with limited knowledge about children's weight issues (e.g., only 21% of parents of overweight or obese children correctly classified their child as overweight or obese in our sample) make Mexico an interesting and relevant place to carry out this field experiment. We study the impact of weight report cards on parental knowledge, obesity-related attitudes and behaviors, and body mass index (BMI) for 2,746 elementary school students.[4] We use data collected from several sources—surveys of parents, child anthropometric measures, and observed attendance rates at an information session on healthy eating and physical activity.

Our intervention is intended to fill a gap in the understanding of the effectiveness of these weight report cards. Several states and countries have implemented weight report cards despite the limited empirical evidence on their effectiveness.[5] As the Centers for Disease

[3]Examples include encouraging students to finish high school (Jensen, 2010), helping low-income families choose schools (Hastings and Weinstein, 2008), and reducing AIDS prevalence (De Walque, 2007; Dupas, 2011a).

[4]BMI is equal to an individual's body weight (in kilograms) divided by the square of his or her height (in meters).

[5]Arkansas, New York City, the United Kingdom, and Malaysia have used them (Evans and Sonneville,

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.

The few studies on weight report cards focus exclusively on developed countries, and these studies suffer from omitted variables bias issues and problems of highly-selected samples.[6] Even putting these concerns aside, these earlier findings are likely not very informative for developing countries where parents are less knowledgable about the prevalence of childhood obesity, the population is poorer, and cultural beliefs about the appropriate body weight are different (Oria and Sawyer, 2007; Guendelman et al., 2010).

Weight report cards may be particularly successful for several reasons. First, as we find in our data, parents are poorly informed about their child's health. Second, personalized health campaigns are generally more effective than non-personalized health campaigns (Hawkins et al., 2008). Recent research rationalizes this finding by showing that tailored information interventions (as opposed to more general information interventions) are more likely to activate areas of the brain important for awareness, which later are important for precipitating behavioral change (Chua et al., 2011).[7] Third, according to the Health Belief Model (Hochbaum et al., 1952), a highly-cited psychological model which attempts to explain health behaviors, a person must understand vulnerability to disease before any behavioral change can occur.

2009; Schocker, April 19, 2011). Additional areas have BMI surveillance programs where students are weighed on a regular basis but only aggregate statistics are reported (Nihiser et al., 2009). Some states have added a BMI calculation to their student's academic report card (`http://www.huffingtonpost.com/2011/04/19/bmi-schools_n_850776.html`)

[6]These include Chomitz et al. (2003); Grimmett et al. (2008); Kalich et al. (2008); Kubik et al. (2006).

[7]While this literature considers the relation between one's own awareness and one's own health, it is reasonable to think that these same principles may apply when thinking about parental awareness and children's health.

In this field experiment, children were randomized into one of four groups: a control group and three 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).[8] Two of the three treatment groups (referred to as the RISK and COMPARE treatments) received information in addition to this basic information. These two treatments were designed to test the effects of different types of information. In particular, the RISK treatment provided the health risks of obesity. Making the consequences of the child's weight status more salient to parents may be important because the costs of healthy behaviors are accrued earlier than the benefits, leading people to procrastinate on engaging in health-improving behaviors (e.g., DellaVigna and Malmendier, 2006; Giné et al., 2010). The COMPARE treatment provided information on the number of children in each weight classification in the child's class in school.[9] The purpose of this treatment was to test the importance of social norms. In classes where the majority of students are obese, learning that your child is obese may worry parents less because the reference group is obese.

Our analysis proceeds in several steps. First, we study whether the report cards changed parental knowledge and attitudes concerning the child's weight. This is likely a necessary condition for changes in behavior to occur. Many informational interventions look at behaviors without documenting whether the information is absorbed and retained, making it then difficult to understand why the intervention was ineffective in the case of null results. We do find that the intervention increased parental knowledge of their child's weight reported one to two months after the intervention. At baseline, 33% of parents of overweight children and only 6% of parents of obese children correctly reported their child's weight status. Following the intervention, those percentages rose to 59% and 20% respectively for those receiving report cards. Additionally, this knowledge translated into changes in parents' beliefs concern-

[8]We describe these classifications in more detail later but they are based on the Centers for Disease Control (CDC) classifications (i.e., are not specific to Mexico).

[9]We tried to keep the information conveyed as simple as possible so we presented counts, which we thought would be easier to understand than percentages.

ing their child's weight. The treatment increased the fraction of parents of overweight and obese children reporting that their child weighs too much. Moreover, reference groups and social norms have important effects on these beliefs. In classes where parents of overweight and obese children were told that more than a third of students were overweight or obese, the report cards had no effect on parental beliefs about the child's weight.[10] Such a finding suggests that as obesity rates rise, parents may be less inclined to believe that their child is obese, and thus, it may be more difficult to induce change. Second, after documenting the effects on parental knowledge and perceptions, we evaluate whether these effects translate into behavioral changes. We observe no changes in observed and self-reported behaviors, including parents' attendance to a session on healthy habits and physical activity, child's enrollment in a sports class, seeing a doctor in regard to the child's weight, and encouraging the child to increase physical activity or in intentions for the future to increase child's physical activity or reduce the quantity of food consumed. Third, we estimate whether there are impacts on children's outcomes such as BMI or weight. We do not find any detectable effects on BMI or weight.

We explore several possible explanations for these null behavioral results. First, it is possible that limited resources affected parents' ability to respond to this new information. Some obesity-reducing actions such as signing a child up for a sports class could be costly. If resources are important for reducing obesity, we would expect that the most educated parents would be the most responsive to the report cards. However, there are no differential responses to the report cards by parental education. Also, a lack of resources likely cannot explain the lack of behavioral changes by parents given that when free resources (i.e., help from nutritionist and an information session on healthy eating and physical activity) were provided, few parents took advantage of them. Second, the report cards may not be meaningful to parents if they are not cognizant of ways to reduce obesity. But from the endline

[10]These findings are reminiscent of those of Ali et al. (2011), who show, using observational data from the National Longitudinal Study of Adolescent Health, that an adolescents' social group affects his/her weight perceptions.

survey, it was clear that most parents were aware of the causes of obesity.[11] Lastly, in order to observe meaningful behavioral changes, it may be necessary that parental concerns about obesity change. We do not observe changes in such concerns nor in the ranking of concern about child's weight relative to other parental concerns. Overall, our results suggest that the provision of weight report cards is simply not enough to induce change despite the positive effects on knowledge and attitudes.

II Experimental Design and Data Collection

A Experimental Design and Timeline

The field experiment took place 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 9,843 US dollars, more than the national Mexican average of 7,025 US PPP 2005 dollars.[12]

Seven primary public schools were selected to participate.[13] Classes from second through sixth grade were considered. All students within each class were surveyed. The children ranged in age between 6 and 14 years old, but most of the sample (96%) was between 8 and 12 years old.

We outline the timeline of the experiment and the different treatment arms in Figure 1. The field experiment began with the distribution of a baseline survey to students to take home to parents to complete (see the Appendix for a copy of the survey). Included in this survey is a diversity of questions – done such to not prime participants about the focus of the study. Of the 24 questions, only 5 concern weight. This survey collected information from the primary caretaker about his/her education, occupation, parental concerns (e.g., H1N1,

[11] However, being cognizant of the causes might not imply that one knows how to reduce obesity.

[12] These statistics 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.

[13] Schools that were neither the poorest or the richest schools in the urban area were considered. Then the sample was restricted further to schools that expressed an interest in participating.

child's weight, child's performance in school), their classification of the child's weight (i.e., underweight, healthy weight, overweight, and obese), and rates of time preference. The baseline survey response rates was 67%. These response rates are higher than some other studies using school-based samples (Angrist et al., 2002; Bettinger and Slonim, 2007). The baseline response rates are not related to treatment status since we stratified the randomization based on whether the family responded to the baseline survey.

Following the collection of the baseline survey, nutritionists weighed and measured all students in the participating classes. Each child's weight was categorized using the BMI-for-age weight status categories and corresponding percentiles established by the Centers for Disease Control.[14]

Next, the students were randomized into one of four groups: three treatment groups (BASIC, RISK, and COMPARE) and a control group. The randomization was stratified based on the combination of school, weight status, and whether or not the baseline survey was completed. An overview of these treatments is presented in Figure 1. The three treatment groups received a personalized health report card that detailed the child's height, weight, and weight classification (i.e., underweight, healthy weight, overweight, or obese). To enable parents to understand these weight classifications, the ranges of weights for each classification were given for each of these classifications based on the child's height, age, and sex. See the Appendix for a copy of an example of the BASIC, RISK, and COMPARE report cards. The weight report cards were sent home in sealed envelopes to parents along with a letter from the school district and contact information of a nutritionist to contact, free of charge, if parents had further questions. We considered the possible adverse effects of the report cards (e.g., the lowering of children's self-esteem). However, in discussions with the research team, we heard of no mention of these type of effects. The control group did not receive this personalized health report card.

[14] 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 and the 85th percentile, overweight if their weight is between the 85th and the 95th percentile, and obese if their weight is equal or greater than the 95th percentile for their age in months, height, and sex.

What distinguishes the three treatment groups is the level of information they received. The BASIC treatment group received the report card as detailed above. The report cards of the RISK and COMPARE treatments included additional information. In particular, the RISK treatment group had an additional script describing the health risks of their child's weight classification. 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 of being overweight/obese. The purpose of this treatment was to make the health risks of being underweight, overweight, or obese more salient to parents. Given that many parents in our sample appear to have present-biased preferences, such salience may lead parents to expend more resources towards long-run investments in health. The COMPARE treatment group obtained the same report card 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, and obese. The intention of this treatment was to understand whether parents' beliefs and actions about their child's weight are dependent on the prevalence of overweight and obese in their child's class. In observational settings, beliefs about one's own weight are impacted by the weights of one's peer group (Ali et al., 2011).

The three treatment groups and control group received an invitation to attend an information session entitled "Practical Tips for Improving Your Child's Eating Habits and Physical Activity." Note that this session does not directly address weight. For the treatment groups, this invitation was sent home along with the report card. For the control group, this invitation was sent by itself. All children regardless of their weight classification received an envelope to take home that included an invitation to this session and if they were in a treatment group, a report card. However, we are primarily interested in the effects among

the overweight/obese populations. Envelopes were distributed to all children to reduce the possible adverse self-esteem effects. The main motive for this invitation was to obtain an observed (i.e., not self-reported) measure of parents' reaction to the weight report card; attendance at this session was one of our main outcome variables. Moreover, since the session was free, a lack of parental response cannot be attributed to a lack of income.[15] Observed behavior (e.g., attendance to the session) and self-reported behavior might be very different. For example, a parent may say that she intends to change her child's habits, but we care mostly about her behaviors rather than her intentions. The information sessions occurred two weeks after the delivery of the weight report card; each school had two sessions.

The administration of the experiment follows the usual operating procedures of the schools. Schools communicate with parents by sending notifications home with the students. Parents are often invited to come to school to discuss school performance and occasionally meetings regarding non-academic topics such as safety and health are scheduled. The intervention adheres to these norms, including following the traditional days of the week and times these meetings are arranged. Typical attendance at these meetings varies across schools but averages 80%.

Following the informational sessions, in March 2010, the endline survey was distributed to all treatment groups and to the control group. The endline survey was intended to capture parental response to the report card information. This survey contained many of the baseline survey questions but also 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, engaged in physical activity with the child, discussed the child's weight with him or her, 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 come from the public health study on body mass index report cards of Kalich et al. (2008). There were also questions inquiring about parental intentions to change the amount of food the child

[15]Of course, this statement does not take into account the opportunity cost of time.

consumed and the amount of exercise he or she engaged in. The post-intervention survey finished with a series of questions about health knowledge and knowledge of their child's weight status. Unlike many previous studies on the effect of information on behaviors, we try to understand the steps by which health information may impact behavior. Documenting these steps is important because, in the case of a null effect of information on behavior, as some studies including this one find, it is not clear whether the result is due to the lack of the information being transmitted or a lack of a response to the new information.[16] Those who attended the informational session filled out the endline survey at the session so their responses would not be affected by the class. In analyses not reported, we examined whether the treatment effects differ for attendees and non-attendees and find similar results across the two groups.

In the second half of May 2010, at the end of the school year, the nutritionists measured the heights and weights of both treatment and control children again to see if the intervention had had any impact on children's weight or BMI.

It is important to note that the randomization was done at the individual level rather than at the school or grade level. The choice to randomize at the individual level was dictated by the fixed sample size. To maximize the power of the experiment, the randomization was performed at the individual level. Given this level of randomization, there is the possibility of cross-contamination effects biasing our estimates. Specifically, one might imagine that a parent in the control group may become more concerned about his/her child's weight if the parent talks with a parent who received the RISK treatment report card. 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. In an effort to reduce cross-contamination effects, there was an attempt to make the information private by delivering home the report cards in sealed envelopes. Moreover, we performed a

[16]Examples of null effects of information on behavior include Giné et al. (2010); Meredith et al. (2012). Giné et al. (2010) estimate no impact of information on smoking behaviors in the Philippines and Meredith et al. (2012) consider the effect of health risk information on the transmission of hookworm.

series of robustness checks, discussed later, which we believe point to small spillover effects.

As some students have siblings in the same school who were also part of the experiment, children of the same household could be assigned to different treatments. Given the tight timeline dictated by the schools' schedules, there was not enough time between the baseline survey and the treatment assignment to determine which children belonged to the same families. As a robustness check, which we discuss later, we consider families with only one child in the experiment where spillovers may be minimal and our results are similar.

B Sample Characteristics and Balance Check

Table 1 provides the means for key variables across the three 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 the overall treatment group mean (combining the three treatment groups together) and the control group mean (i.e., treatment=control column) and the other testing the equivalence of the means of all four groups (i.e., all equal column). Panel A presents the baseline anthropometric data (not conditional on completion of the baseline survey) and Panel B presents data from the baseline responses collected from the primary caretaker.

The randomization worked well. None of the p-values testing whether the treatment averages are different from the control averages dip below 0.05. Only two of the p-values (concern about child's weight and concern about child's school performance) are less than 0.05 in a test of equivalent means across all 4 groups. This is not surprising given the large number of means contrasted. These differences, however, are slight and suggest that parents in the control group were slightly more concerned about their children on a number of dimensions.[17,18]

Panel A shows that 2,746 children participated in our study (i.e., were in class the day

[17]We have also run all our regressions controlling for these baseline characteristics and we observed no substantial changes in our treatment effect estimates. Results are available upon request.

[18]The NAs for p-values are due to the fact that our p-values are based on regressions with strata fixed effects and as such, there is no variation in the variables we stratified on within the strata.

the baseline weight and height measurements were collected). Approximately, half of the children were male and the average age was nearly 10 years old. Obesity rates among these young children hovered just over 10% and overweight rates are just under 20%.[19] Moreover, 33.6% of boys and 26.5% of girls were obese or overweight. These percentages match well with published statistics from the 2008 National Schoolchildren Survey (Levy, 2010).[20]

Panel B indicates that the baseline survey respondent is most frequently the mother (67%). In the remaining cases, it was primarily the father (30% of total responses). The level of parental education is low: over 30% of primary caretakers had not completed high school.

To gauge how concerned parents were about obesity, we asked parents about their level of concern on several dimensions—parents' own weight, child's weight, H1N1, and child's performance in school. Parental concern about their child's weight was the second lowest of all concerns, only above concern about the caretaker's own weight.

Table 2 presents the analogous table to Table 1 but for the sample of overweight and obese children, the target population for this intervention. The randomization here is also fairly balanced, which is unsurprising given that weight status is one of the stratification variables. Most of the means are similar to those in Table 1 with the exception of concern about child's weight and parental classification of the child's weight. Not surprisingly, parents of obese and overweight children were more likely to characterize their child as overweight or obese than the overall population was, and parents of obese and overweight children were also more concerned about their child's weight.

Since we look at several post-survey outcomes, Appendix Tables 1 and 2 replicate Tables 1 and 2 conditional on completion of the endline survey. For the overall sample, the treatment and control groups are still balanced with the exceptions of slight differences in concern

[19]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`. The overweight statistic is not provided.

[20]Indeed, this survey shows that, for primary school children within the state of Puebla, 27.6% of boys and 23.9% of girls are classified as obese or overweight.

about child's weight and concern about child's school performance akin to those observed in Table 1. For the overweight and obese, across most variables, we are unable to reject the equivalence of means across the groups in Appendix Table 2. However, the primary caretaker characteristics (i.e., education) differ across the treatment and control groups. To deal with this imbalance, we can control for caretaker educational level, and our regression estimates are very similar.

C Parents' Knowledge about Child's Weight Status

As our goal is to evaluate the impact of weight report cards on parental knowledge, attitudes, and behavior, it is important to know how knowledgeable parents are about their child's weight status at baseline. In Table 3, we examine parental misperceptions of their child's weight by looking at parental classification at baseline versus actual classification of weight status. If caretakers can accurately classify their child's weight, the main impact of the report cards would likely be a salience effect. It is clear, however, that there are large misperceptions. 67% of caretakers of overweight children and 94% of caretakers of obese children underestimated their children's weight status. These misclassification percentages are much higher than those found in U.S. samples, which ranged from 35 to 50% (Neumark-Sztainer et al., 2008; Warschburger and Kroller, 2009).

In order to understand the prevalence of underweight, overweight, and obese further along with misclassification rates, we next explore the cross-sectional partial correlations between weight status and weight misclassification and parental and child attributes in Table 4. Columns (1) through (3) of Table 4 report estimates from separate linear regressions of weight status (i.e., underweight, overweight, and obese) on these attributes. Column (4) examines the relationship between whether the caretaker correctly classified the child's weight in the baseline survey and these characteristics. For this regression, we also control for the child's weight status as weight status is a strong predictor of whether the caretaker could correctly classify the child's weight. We should, of course, take caution in extrapolating too much

from these regressions given that they are subject to usual concerns about omitted variables bias.

If part of the reason why some children are obese or overweight is 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. Interestingly, however, we find that 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). The most educated however, are most likely to correctly classify their child's weight, suggesting that lack of knowledge may be an explanation of the high rates of misclassification observed earlier. Table 4 also shows that rates of obesity are higher among male children.

Aside from these socioeconomic characteristics, we assess whether a parent's time preferences are predictive of his/her child being underweight, overweight or obese and correctly classifying the child's weight.[21] Since 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-inconsistent preferences.[22] While it is more typical to consider the relation between one's own time preferences and own's obesity risk, here we are thinking about a parent's time preferences and his/her child's obesity risk. Nevertheless, if parents are altruistic, parents with self-control problems may be prone to postpone actions that would help their child become more healthy such as limiting the consumption of unhealthy snack foods and encouraging them to be more physically active. This is because the costs of such

[21] Our baseline survey collected answers to standard time preference questions. We use the same wording and setup of the time preference questions used by Ashraf et al. (2006). As in Ashraf et al. (2006), we classify individuals into 4 categories: always patient (31% of the sample), always impatient (45%), future biased (4%) or present biased (20%). This classification is based on answers to two hypothetical questions: (a) Do you prefer 500 pesos today or 625 pesos in 1 month? and (b) Do you prefer 500 pesos in 6 months or 625 pesos in 7 months? For exact wording of these questions, see a copy of the surveys in the Appendix. An individual preferring 500 pesos today and 500 pesos in 6 months was labeled as always impatient. An individual wanting 500 pesos today and 625 pesos in 7 months was designated as present biased. An individual asking for 625 pesos in 1 month and 500 pesos in 6 months was classified as future biased. Finally, an individual preferring 625 pesos in 1 month and 625 pesos in 7 months was labeled always patient.

[22] Courtemanche et al. (2011) provide evidence of a relationship between time inconsistency and obesity in the United States.

actions, which include combating resistance from one's child, are accrued earlier than the benefits (i.e., a healthier child). Overall, time inconsistency (being either present biased or future biased) shows no relation to being underweight, overweight, or obese. For overweight and obese, in fact, present biased individuals appear to be less likely to have overweight or obese children. It is unclear whether this finding is due to a lack of a relationship between parental time preferences and child obesity risk or it is due to the context (i.e., Mexico versus the United States). In evaluating the effects of the intervention, we have looked at whether there is heterogeneity in the treatment effects by the degree of time inconsistency, our analysis does not point to substantial treatment heterogeneity in that regard.

III Results

A Empirical Strategy

To estimate the effect of the report cards on our outcomes of interest (e.g., parental attitudes, parental behaviors, and child's BMI), we first assess the overall treatment effect via regressions of the following form:

$$Y_i = \beta_0 + \beta_1 T_i + \gamma_{as} + \delta_r + \epsilon_i \tag{1}$$

where Y_i is an outcome of interest for individual i, T_i 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, γ_{as} are child's age in years times sex fixed effects, δ_r are randomization strata fixed effects, and ϵ_i is the error term. The randomization of the treatment makes the inclusion of age by sex fixed effects unnecessary but, as many of the studied outcomes vary with age and sex, we include these fixed effects as a means of obtaining more precise estimates.[23] Our estimates are similar to those without these fixed effects. We estimate

[23] In principle, one could include baseline survey measures as controls to increase precision, but in our case, their inclusion does not change our standard errors much so we exclude them.

heteroskedastic-consistent standard errors.

Second, to discern how the effect of the report card varies across the type of report card, we estimate the following:

$$Y_i = \beta_0 + \beta_1 BASIC_i + \beta_2 RISK_i + \beta_3 COMPARE_i + \gamma_{as} + \delta_r + \epsilon_i \quad (2)$$

where $BASIC_i$, $RISK_i$, and $COMPARE_i$ are each treatment indicators equal to 1 if the child is assigned to that treatment group respectively and 0 otherwise.

B Attrition - Endline Survey and Endline Weight & Height Measurements

Many of our main outcome variables come from responses to an endline survey. To insure that our subsequent analyses are not impacted by selection bias due to differential response rates across the treatment and control groups, we estimate whether endline response rates are different for the treatment and control groups. The results are presented in Table 5. We consider the overweight/obese, healthy weight, and underweight samples separately as the effects of the report cards are likely to be heterogeneous across these groups and in our main analysis, we examine these subsamples separately. For each subsample, we estimate two regressions: (a) endline survey response rates as a function of treatment and (b) endline weight and height measurement rates as a function of treatment. Across the three subsamples, we see no statistically significant differences in response or measurement rates across the treatment and control groups. For the overweight/obese sample, endline survey response rates are arguably quite high given that the surveys were not personally-administered (63% for the control group). The mean endline measurement rates of weight and height all exceed 90%. Since these measurements occurred during the school day and no one, to our knowledge, declined being measured, the lack of endline height/weight measurements is due to

school absences. These measurement rates are consistent with attendance rates.[24]

Aside from the difference in response rates, we also compare how the sample of endline respondents differs across the treatment and control groups. As discussed earlier, Appendix Tables 1 and 2 replicate Tables 1 and 2 for the sample of endline respondents. There are few differences in observable characteristics across the treatment and control groups. When we control for any observed differences, the treatment effects are similar to those reported earlier (results not reported).[25]

C Treatment Results

Having established that sample selection due to attrition may not be a large concern, we now move to estimating our main treatment effects for the overweight/obese. We provide the results for the healthy and underweight as a validity check in Appendix Table 3. Table 6 presents these results based on estimates of equation (1). Each estimate comes from a separate regression. We separate the outcomes into 3 groups: outcomes measured in the endline survey, outcomes measured from observed behavior, and endline height and weight measurements. The sample sizes differ across these 3 groups due to survey response. For endline survey outcomes, the estimates are based on the sample of endline survey responders. The sample sizes also vary across these outcomes due to item non-response. For the observed behavior outcome, the sample is all students who were initially weighed, and for the endline measurements, the sample consists of those who attended class on the day of the endline weight/height measurements and who were present for the baseline weight/height measurements. Thus, endline measurement sample and endline survey sample are subsets of the observed behavior sample, but the endline measurement sample is a bigger subset as there was less attrition for these measurements when compared to the endline survey.

[24]The school district did not notify parents about the timing of the height and weight measurements.

[25]One may worry that a comparison of the observable characteristics in Appendix Tables 1 and 2 is also subject to selection bias. In particular, many of these pre-intervention characteristics in Appendix Tables 1 and 2 come from the baseline survey. However, we check whether baseline weight and height are different across the treatment and control groups for the sample of endline respondents. We observe no statistically significant differences across these groups for the overall sample and for the sample of overweight and obese.

The endline survey responses could vary by whether the father or the mother was the primary caretaker. Importantly, however, when we estimated these effects separately by whether the father or the mother responded to the survey, we found no differential responses across these two groups. Thus, we pooled them together.

The estimates in Table 6 are intent-to-treat effects, not treatment effects on the treated. Of course, since some parents may not have received or read the report cards, the treatment effect on the treated will be larger. We hesitate to report treatment effects on the treated because the first-stage estimates of the effect of the treatment on report card receipt is self-reported. Nevertheless, we believe that most parents received and read the report cards. Ninety percent of respondents to our endline survey reported receiving a report card. Even taking into account non-response to the endline survey, under a worst case scenario, nearly 60 percent of parents read the report card. One may then want to upweight the intent-to-treat effects to think about the treatment effects on the treated.

First, we are interested in whether the cards affected parental knowledge among the overweight/obese. At the center of the Health Belief Model (Hochbaum et al., 1952) is the idea that health behavioral change is contingent on understanding vulnerability to disease. Column (1) reports estimates of the report cards on whether parents correctly classified the weight of the child in the endline survey. The intervention had a strongly statistically significant and positive impact on correctly classifying the child's weight. The treatment increased this percentage by nearly 60%.

Next we explore how this new knowledge changed parental perceptions about their child's weight. While the intervention changes parental classification of the child's weight, it is not immediately clear how parents interpret this information. In the recent past, being obese/overweight in Mexico was indicative of wealth and thus desirable (Oria and Sawyer, 2007). The effects on parental perceptions are easily visualized in Figure 2 which shows, by weight classification, the distribution of parental responses to the question, "How would you characterize your child's weight?" for the treatment and control groups. Across all four

weight categorizations, the treatment moved parental responses in the expected direction. The effect of the treatment was particularly remarkable for the obese. Among this group, only 6% of control group parents reported that the child weighed much too much whereas among the treatment group this figure was 28%.

These effects are quantified in column (2) of Table 6. For the obese/overweight sample, the report card raised the propensity to report that the child weighed too much by a statistically-significant 12 percentage points off of a base of 58%.

Despite the effects on knowledge and beliefs for overweight/obese, there are no statistically significant effects on behaviors or parental concern for this sample. The effect of the intervention on parental concern is small at 0.04, 1/20th of a standard deviation. Given this null effect, it is not surprising that we observe no effects on actions - either looking at the total number of actions or whether parents had at least one action.[26] Like the parental concern effect, these treatment effects are very modest. For example, the upper bound of the 95% confidence interval for the number of actions is 0.36 (a standard deviation for this variable is 1.51). Moreover, when looking at the actions separately, there are no statistically significant impacts (see Appendix Table 4).[27]

Although it is reasonable that the timing of the intervention left parents some time to engage in behavioral change, especially given that the number of actions undertaken in the last month by control parents was 2.2 (out of a possible 7), one may want to look at changes over a longer term. Next we examine the effects on intentions in regards to eating and physical activity. We view these outcomes as less preferred compared to actual actions because parents may not follow through with their intentions. In terms of eating behaviors, the effect of the treatment is sizable but not statistically significant. Treatment effects on intentions in relation to physical activity are more challenging to identify as most parents

[26]These actions include: seen a medical professional in regards to the child's weight, put the child on a diet, had the child skip meals or snacks, engaged in physical activity with the child, discussed the child's weight with him or her, family members, or friends, and/or signed the child up for a sport or exercise class.

[27]One can also categorize these actions in different ways (e.g., combining the physical activity actions together or the weight actions together) and there are still no statistically significant effects on these outcomes.

intend to have their children engage in more physical activity.[28]

In terms of non-self-reported outcomes, the intervention did not induce changes for the obese/overweight sample. Although nearly all parents expressed that a class on eating habits and physical activity would be useful and that child's BMI is positively associated with attendance at the session, the report card did not induce parents of overweight/obese to attend the informational session. Given the null results on parents' actions and self-reported behaviors, the treatment effects on weight and BMI are not surprising. The confidence intervals of these estimates exclude negative effects larger in magnitude than -0.7% and -2.1% on BMI and weight, respectively.[29] For comparison, in a study of similarly-aged children in the United States conducted over a period of 6 months (a little longer than our study), Spiegel and Foulk (2012) find that their randomized intervention which consisted mainly of an educational campaign about physical activity and eating reduced BMI by 0.3, an effect size outside of our 95% confidence interval.

We can also gauge the size of these effects by comparing these changes to the average changes between the pre-intervention and post-intervention period. These were -2.5% and 0.6% for BMI and weight, respectively.[30] For Mexican children of similar age groups, Gómez-Díaz et al. (2004) also find that BMI does not necessarily monotonically increase with age. Although the gap in time between the two sets of weight and height measurements was only

[28]We have also examined whether the treatment affected health knowledge using questions from the endline survey and found no effects.

[29]As a robustness check, we trimmed the sample to deal with outlier observations; the second round of height and weight measures had some obvious measurement errors. To address this issue, we dropped observations with weights exceeding the minimum and maximum weights observed with the pre-intervention measurements (16 kilograms was the minimum and 83 kilograms 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 kilograms corresponds to the 99.92 percentile (i.e., only 2 observations have values above that threshold). This will necessarily drop a few possibly valid observations that were near 83 kilograms at the outset but our results are not sensitive to this 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, we dropped observations (34 observations) where the change in height was less than -5cm. As a robustness check we also use robust regressions, which give less weight to outlier observations, and end up with similar estimates.

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

four to five 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. However, it is possible that the examined time period may have been too short for parents to have had adequate time to alter their actions (e.g., enroll child in a sports class) although as noted previously parents do partake in these actions. On the other hand, 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.

In Appendix Table 3, we present estimates for the healthy weight and underweight, mainly as a plausibility check for our main results for the overweight/obese. Like that for the overweight/obese, the report card has a positive effect on correctly classifying the child's weight. For the healthy weight, the intervention lowers the fraction misclassifying their child by over 50%, an effect that is statistically significant at the 1% level. The effect for the underweight is of nearly the same size in percentage points although not statistically significant due to the small sample size. For the remaining outcomes (e.g., actions and weight), as expected a priori, the report card has little impact on the healthy weight subsample. The one exception is attendance at the information session where the treatment leads to lower rates of attendance for the healthy weight. To understand this effect, one can think of the report card as resolving some uncertainty. For the more concerned parent, the report card may act as assurance (i.e., good news), leading them to be less likely to go to the informational session than those who did not receive a report card (i.e., the control group). On the other hand, for the less concerned, the information in the report card may not have had this type of effect. Indeed the treatment effects follow this pattern with the effect on attendance being concentrated among the most concerned (75% of the sample); for the less concerned, the treatment effect on attendance is positive although not statistically significant. Overall the effects on the healthy weight and underweight largely confirm that the intervention had little effect on behaviors and outcomes, aside from the impact on attendance at the information

session for the healthy weight but had a positive impact on knowledge about the child's weight.

We also looked to see whether these overall results hide some interesting treatment effect heterogeneity. Probably the most obvious heterogeneity to examine is the variation in treatment effects by how surprising the report card information was. In unreported analyses, we look at whether the treatment effect varies with the degree of surprise as measured by the difference between the child's actual weight classification and the parent's weight classification in the baseline period. The more surprising the information received is, the more of a response we would expect. For the outcome of believing the child weighs too much, we do find that the treatment effect varies positively with the surprise factor. Yet, even for this group, we do not estimate statistically significant effects on parental behaviors or child outcomes.

i Robustness Checks - Possible Cross-Treatment Contamination Effect

The randomization at the child level left open the possibility that there were spillover effects across the different treatments. We gauge the extent of cross-contamination effects in three ways: (a) examining changes in survey responses from baseline to endline for the overweight/obese control group, (b) looking at the results for children who have no siblings in the experiment, and (c) estimating how the treatment effects vary with the fraction of students treated in each class.

Starting with the first approach, for the outcomes for which we have baseline and endline measures, we estimate whether there are statistically-significant changes in the outcomes for the control group. If the treatment affects the control group, we might expect to observe "treatment" effects for this group (i.e., significant changes). Such effects would likely dampen the main treatment estimates in Table 6. The control group outcomes, however, may also change between the two surveys for other reasons besides spillover effects of the treatment. For example, in the presence of strong age effects, changes from the baseline survey to the

endline survey may be large. For this reason, we consider the non-weight outcomes.

Appendix Table 5 presents estimates from regressions of the control group change on an intercept for the subsample of the overweight and obese. Any intercept estimates statistically different from zero imply that the control group mean changed during the intervention. We do not observe any significant differences in responses between the baseline survey and endline survey when considering the outcomes of correctly classifying the child's weight, parental beliefs about whether the child weighs too much, and parental concern about the child's weight. The magnitudes of the changes are small relative to the main treatment effects reported in Table 6. For instance, the main treatment effect for classifying the child's weight correctly is 0.156 whereas the difference for the control group reported in Appendix Table 5 is 0.020. Similarly, for the outcome of weighing too much, the treatment effect is 0.122 whereas the control group difference is 0.041. Thus, the experiment does not appear to affect the control group behavior.

Our next robustness check considers the effect of the treatment on families with only one child in the experiment in Table 5. One could imagine that spillovers might be larger among families with more than one child in the intervention because for instance, two children in the same family may have received two different treatments. In general, the magnitudes of the estimates are similar across the overall sample and the sample with only one child in the experiment.[31]

Finally, we examine how the treatment effects vary with the fraction treated in the class (results not reported).[32] Due to small sample variation, the fraction treated varies from 0.58 to 0.96 across classes (72 classes in total). Of the 3 robustness checks, this check is the least precise; for none of the outcomes in Table 6 does the treatment effect vary significantly in a statistical sense with the fraction treated albeit the results are imprecise. For the outcomes of correctly classifying the child's weight and believing that the child weighs too much, the

[31]For example, the overall estimate for correctly classifying your child's weight for the overweight/obese sample in Table 6 is 0.122 whereas among the sample considered in Appendix Table 6, it is 0.138.

[32]We use fraction treated in the whole class, not the fraction of the overweight/obese treated.

larger the fraction treated the more likely a parent is to correctly classify the child's weight or report that they weigh too much. Interestingly, for the action outcomes, the treatment effect varies negatively with the fraction treated. As such, these results taken literally imply that randomization at the classroom or school level might have led to larger effects on knowledge but even smaller effects on actions. Together these robustness checks give us some confidence that cross-contamination effects are not a first-order concern.

D Heterogeneity in the Treatment Effects

i Results by Treatment Type

So far, we have considered the general effect of the report card without regards to the type of report card received. We now look at the effects by treatment type (BASIC, RISK, and COMPARE). Table 7 reports the regression results of estimating equation (2).

Ex ante, we might expect that the RISK treatment would have a stronger effect than the BASIC treatment because relaying the health risks of obesity would make such risks more salient to parents. On the other hand, recent economics and psychology literature argues that people sometimes suffer from limited attention.[33] This phenomenon implies that the provision of additional information could be distracting to people, leading the BASIC treatment to be at least as powerful as the RISK treatment.

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, problems of cognitive errors may impact the effects of this treatment because the information conveyed is more complicated (i.e., distributions may be hard to understand).

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

Looking at the results reported in Table 7, differences in the treatment effects across the different report cards seem small; none of the treatment effects are statistically distinguishable across the three treatment groups. For the outcome of weighing too much, the BASIC treatment effects exceed those of the other two treatments. But the BASIC treatment does not always trump the other treatments if we look across the other outcomes. The possible differential effects are too small to discern with the sample at hand.[34] In fact, even if we consider the full sample - overweight/obese, healthy weight, and underweight, where we have more power, for the outcome of correctly classifying your child's weight, the effects across the treatment groups are so similar that they are statistically indistinguishable.

ii Effect of Norms

Ex ante, we suspected the impact of the COMPARE treatment to be a decreasing function of the fraction of children who are overweight/obese in the class. A parent of an overweight/obese child may be more concerned when fewer of his/her child's classmates are obese/overweight.

In Table 8, we consider exclusively the control and COMPARE treatment subsamples and we test these predictions by interacting the treatment dummy with a variable indicating whether the fraction of obese/overweight students in the class is more than 36%, between 25 and 36%, and less than 25%. These groupings represent the upper quartile, interquartile range, and lower quartile of the distribution of the classroom fraction of obese/overweight students. To estimate these effects, we estimate regressions of the following form:

$$Y_i = \beta_0 + \beta_1 T_i + \beta_2 T_i D_{2i} + \beta_3 T_i D_{3i} + \beta_4 D_{2i} + \beta_5 D_{3i} + \alpha_g + \epsilon_i \tag{3}$$

where T_i is an indicator variable equal to 1 if the student is in the COMPARE group and 0 if the student is in the control group, D_{2i} is an indicator variable equal to 1 if the student

[34]For example, to distinguish a 0.02 difference across the treatments, we would need a sample roughly 6 times as large for the outcome of a child weighing too much.

is in a class where the fraction of obese/overweight students is between 25 and 36% and 0 otherwise, D_{3i} is an indicator variable equal to 1 if the student is in a class where the fraction of obese/overweight students is more than 36%, and α_g are school by grade fixed effects. Since the fraction of obese/overweight children in each class is not random, we include grade by school fixed effects, effectively comparing students across classrooms within the same grade and school.[35] There are 28 grade times school combinations and all but 7 of them have variation across classrooms in the quartile of the classroom fraction of obese/overweight students. We exclude the age by sex fixed effects and stratification fixed effects since the grade times school fixed effects are nearly collinear with the grade by school fixed effects.

The results in Table 8 imply that the larger the fraction of obese/overweight in the class, the less likely a parent was to report that his/her overweight/obese child weighed too much. For example, for obese/overweight children in a class with the largest fraction of obese/overweight, the treatment effect on parental beliefs that the child weighed too much is small (i.e., 0.379-0.401=-0.022). On the other hand, the treatment effect on this outcome for classes with the smallest fraction of overweight/obese (<25% overweight/obese) is positive and much larger (0.379). Not surprisingly given the earlier estimates, effects on parental beliefs about whether the child weighs too much do not translate into observable effects on parental behaviors.[36]

We test the plausibility of the estimates in column (2) in two ways. First, as a placebo test, we use the same parental beliefs question but use the baseline survey response. We should not expect to find a similar pattern as in the endline survey and we do not. Second, we assess whether information about the distribution of the weights of children in the class was retained. Specifically, we estimate whether the COMPARE treatment affected whether parents answered the question "How would you classify the weight of most of the children in your childs class?" correctly. Here we find a significant effect of the COMPARE treatment relative to the control and the other treatment arms. This finding also serves to validate these

[35]Results are similar without adding these controls.

[36]In results not reported, the effects on BMI and weight are also statistically insignificant.

survey questions; one worry with the correct weight classification measure as an outcome is that our main results could be the result of an increased willingness to report their child's weight accurately, perhaps due to reduced stigma, rather than due to the treatment. The correct characterization of the weight of the children's peers may be subject less to this source of reporting bias and thus, since we find an effect here on the characterization of the weight of the children's peers, this may alleviate concerns about reporting bias.

This finding that obesity perceptions are related to the obesity levels of the peer group is consistent with Ali et al. (2011), who use the National Longitudinal Study of Adolescent Health and conclude that the obesity rates of one's peers affect one's own weight perceptions. Also, Guendelman et al. (2010) finds that norms affect perceptions of ideal body weights. In their study, parents of Mexican children in Mexico had higher ideal body weights for their children than similar parents living in the United States. These results imply that as obesity rates increase, it may become harder to make individuals recognize that obesity is a health issue. Thus, policies relying on individuals to make lifestyle changes may be increasingly difficult as more individuals become obese or overweight because individuals' reference points in regards to the accepted healthy weight may change. On the positive side, interventions that induce some individuals to reduce obesity may have important spillover effects and precipitate change amongst others by altering the reference point.

IV Discussion

A Relation to Previous Work on the Effect of Report Cards

To put our results n context, we discuss the earlier public health and medical literature on weight report cards (Chomitz et al., 2003; Grimmett et al., 2008; Kalich et al., 2008; Kubik et al., 2006). These studies suffer from problems of non-randomized designs or low survey response rates. They focus on the effects in developed countries (United States and United Kingdom). We discuss briefly the results of the study by Chomitz et al. (2003) conducted in

Cambridge, Massachusetts, as it has a randomized design. Chomitz et al. (2003) collect data using a telephone survey that has a response rate of 34%. The degree of misclassification of weight status is more severe in our study. Chomitz et al. (2003) report that 16% of parents with an obese child classify their child's weight status correctly compared to 6% in our study. In our context, report cards have a larger effect on correct classification. But unlike our own study, Chomitz et al. (2003) find that among both the overweight/obese and the healthy weight, parents receiving report cards are more likely to report to having engaged in weight-modifying behaviors for their children including physical activity and dieting.[37]

B Concluding Thoughts

We study how the provision of information affects behavior. Specifically, we examine the effect of weight report cards on parental behaviors and children's outcomes in Mexico. Despite the rapid growth in obesity in developing countries, and particularly in Mexico, there has been a dearth of obesity research, both looking at the causes of obesity and understanding effective policies to curb these trends. Relative to many other childhood obesity policies (e.g., increases in physical activity classes), weight report cards have advantages: they are low-cost, interfere minimally with the school curriculum, and are easily scaled up. The potential usefulness of our intervention is grounded in the idea that a necessary pre-requisite for behavioral modification is the understanding of the risks associated with the disease (Health Belief Model (Hochbaum et al., 1952)). Thus, childhood obesity policies may only be effective if people are cognizant of the risks of childhood obesity and their child's obesity status. But, if people do not understand or care about their child's susceptibility to obesity and its risks, the many paternalistic obesity policies (e.g., soft drink taxes, the banning of trans-fat foods) may be less successful because of unintended consequences. As an example, Fletcher et al. (2010) conclude that increases in soft drink taxes lead to the consumption of other high calorie beverages, effectively undoing the intended effects of the policy.

[37] Chomitz et al. (2003) do not explore the effects on weight or BMI.

Our main results suggest that weight report cards are an effective means of transmitting obesity information to parents. Parents become more informed about their child's weight, and, for parents of overweight/obese children, this information changes their beliefs about their child's weight. These perceptions have an important interaction with peer obesity levels. In particular, the more obese/overweight a class is, the less likely a parent is to report an overweight/obese child as weighing too much. Extrapolating these findings, growth in the prevalence of obesity may shift perceptions about healthy body weights. As these social norms change, parents of obese children may be less inclined to believe that their obese child is obese, making it challenging to encourage parental behavior changes that will improve their children health. On a more promising note, interventions may harness the power of the norm if the intervention precipitates behavioral change amongst some subsample.

The puzzling finding of the paper is why we did not observe any impacts on behaviors, given that parental knowledge increased. There are many possible explanations for these null results—most of which we are not able to rule out. First, parents could believe that childhood obesity has little relevance for adult obesity. However, this explanation is somewhat at odds with the observation that the treatment affected parental beliefs about the child weighing too much. Second, the risks of obesity may not yet be particularly salient, especially in a society where obesity is a relatively new health problem and which has battled problems of underweight in the past. It is possible that once parents become more aware of the risks of obesity, we will see more of them taking pro-active steps to reduce childhood obesity. Third, 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). We do not however estimate differential treatment effects by parental education. Also, when provided free resources to help address obesity (i.e., the informational session and assistance from a nutritionist), we see relatively few families taking advantage of such resources.

Information is simply not enough to induce to change in this context. Indeed some of

the most successful informational interventions in developing countries couple information with remedies (Dupas, 2011b). Thus, an effective weight report card intervention may also need to be combined with a set of actions helpful for reducing obesity. In some sense, the informational session of this intervention served as this set of actions. But we saw little interest in the session. However, the provision of direct information on how to reduce childhood obesity may be more fruitful. Future research should test whether the report cards combined with specific suggested actions (e.g., restricting portion sizes) are more effective.

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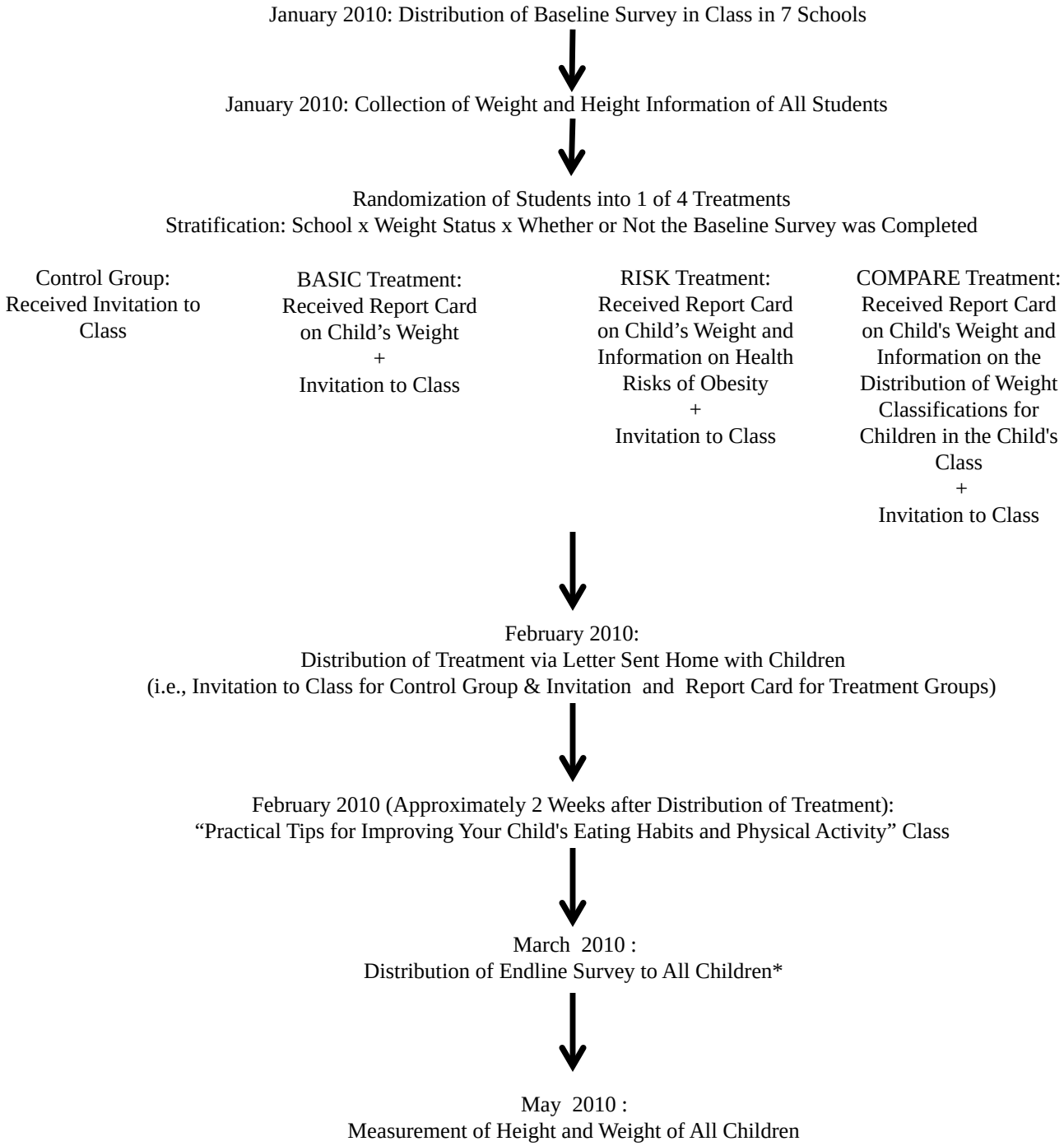
Figure 1: Description of Treatments



*In the case that caretakers attended the "Practical Tips for Improving Your Child's Eating Habits and Physical Activity " Class, we had caretakers fill out the endline survey at the information session as we did not want their answers to the endline survey to be affected by the class. We estimate treatment effects separately for attendees and non-attendees and find similar results.

Figure 2: Distribution of Post-Intervention Parental Attitudes about Child's Weight

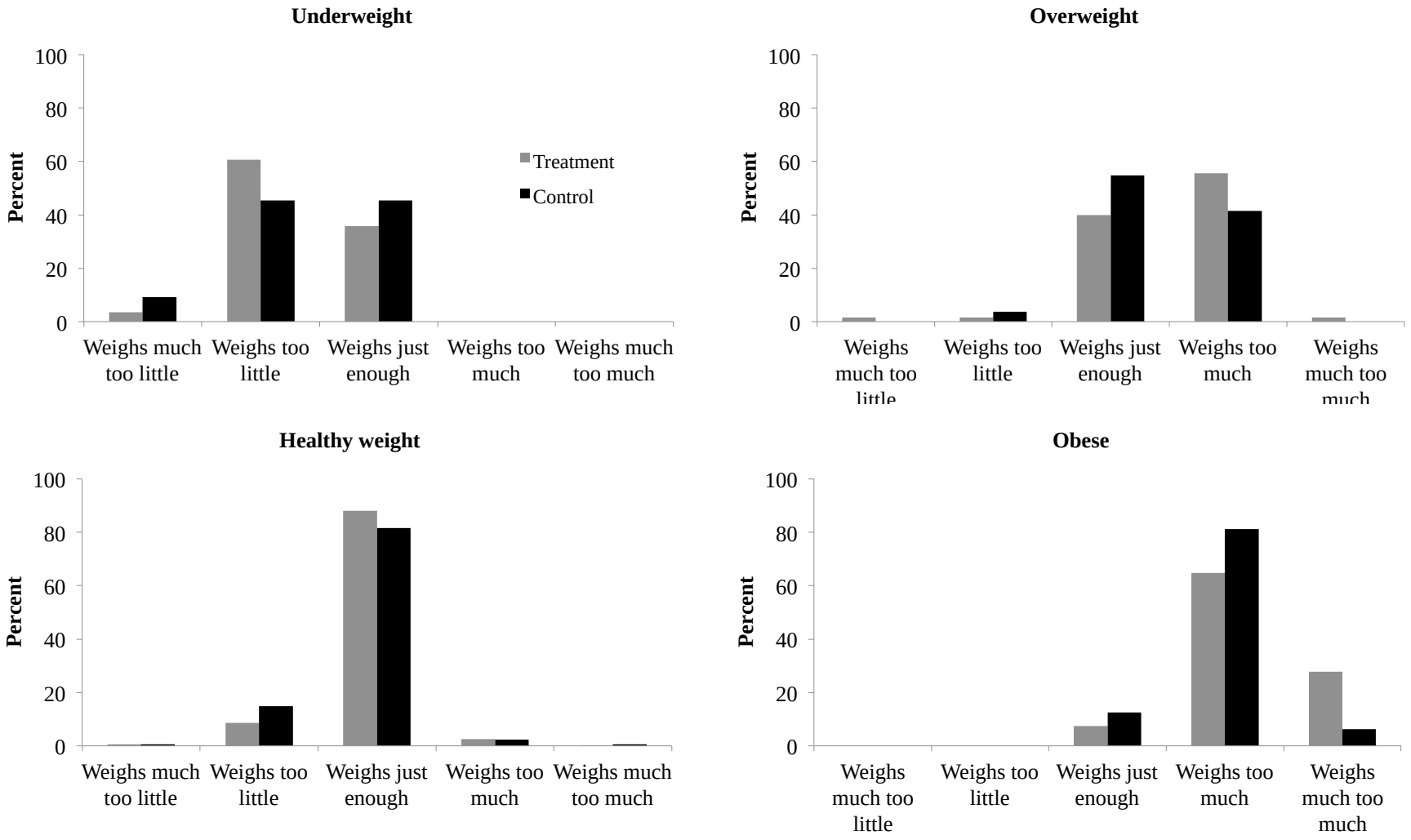


Table 1: Baseline Characteristics - Overall Sample

	Mean				P-value	
	Control	**Basic**	**Risk**	**Compare**	**Treatment = Control**	**All equal**
Panel A: Child Measurement						
	N=673	*N=702*	*N=680*	*N=691*		
Male	0.50	0.47	0.48	0.51	0.41	0.55
Age	9.78	9.80	9.84	9.85	0.69	0.37
	[1.17]	[1.25]	[1.29]	[1.22]		
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: Baseline Survey Responses by Primary Caretaker						
	N=499	*N=508*	*N=505*	*N=518*		
Primary Caretaker: Mother	0.67	0.69	0.68	0.65	0.61	0.84
Primary Caretaker: Father	0.30	0.29	0.30	0.32	0.78	0.99
Primary Caretaker: Other	0.03	0.02	0.02	0.03	0.24	0.58
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 [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]		
Classifies child as underweight	0.02	0.02	0.02	0.03	0.68	0.74
Classifies child as healthy weight	0.55	0.55	0.56	0.57	0.87	0.48
Classifies child as overweight	0.06	0.07	0.05	0.06	0.88	0.81
Does not know weight classification	0.37	0.36	0.37	0.34	0.72	0.53
Child's school performance relative to peers [-2-2]	-0.02	-0.09	-0.06	-0.05	0.69	0.36
	[0.73]	[0.74]	[0.71]	[0.73]		
Happy with child's school performance [0/1]	0.67	0.68	0.68	0.72	0.29	0.39
Internet access at home [0/1]	0.39	0.35	0.39	0.39	0.42	0.62
Other children in experiment [0/1]	0.30	0.29	0.27	0.28	0.50	0.25
Response rate to baseline survey	0.74	0.72	0.74	0.75	0.24	0.68

Notes: Table presents means and standard deviations in brackets for continuous variables. For child's school performance relative to peers, a response of 0 indicates that the student's performance is average; below 0 is below average and above 0 is above average. P-values are from regressions of these characteristics on a treatment dummy [treatment=control] or the set of treatment dummies [all equal]; these regressions include randomization strata fixed effects based on the combination of weight status, school, and whether the baseline survey was completed. The fraction of parents who classify their child as obese is very close to 0 across all categories and therefore is omitted. All p-values with NA values are not defined since those are variables upon which randomization was stratified. Thus, as we include strata fixed effects in measuring the differences across groups, there is no within strata variation in these stratification variables.

Table 2: Baseline Characteristics - Overweight and Obese

	Mean				P-value	
	Control	**Basic**	**Risk**	**Compare**	**Treatment = Control**	**All equal**
Panel A: Child Measurement						
	N=196	*N=217*	*N=202*	*N=209*		
Male	0.59	0.51	0.53	0.57	0.27	0.17
Age	9.81	9.86	9.82	9.92	0.73	0.51
	[1.08]	[1.14]	[1.21]	[1.15]		
BMI	22.32	22.55	22.44	22.37	0.76	0.54
	[2.68]	[2.63]	[2.74]	[2.48]		
Fraction Overweight	0.59	0.57	0.58	0.58	NA	NA
Fraction Obese	0.41	0.43	0.42	0.42	NA	NA
Panel B: Baseline Survey Responses by Primary Caretaker						
	N=131	*N=142*	*N=134*	*N=139*		
Primary Caretaker: Mother	0.67	0.67	0.64	0.58	0.33	0.41
Primary Caretaker: Father	0.31	0.30	0.34	0.38	0.48	0.52
Primary Caretaker: Other	0.02	0.02	0.03	0.04	0.86	0.54
Less than High School	0.34	0.28	0.28	0.22	0.13	0.05
High School	0.41	0.45	0.44	0.47	0.91	0.63
More than High School	0.24	0.28	0.28	0.30	0.51	0.16
Concern about H1N1 [1-4]	3.30	3.20	3.27	3.28	0.71	0.59
	[0.84]	[0.79]	[0.85]	[0.83]		
Concern about child's weight [1-4]	3.31	3.29	3.20	3.23	0.51	0.29
	[0.82]	[0.82]	[0.90]	[0.82]		
Concern about own weight [1-4]	3.12	3.08	3.01	3.11	0.77	0.59
	[0.97]	[0.96]	[1.00]	[0.87]		
Concern about child's school performance [1-4]	3.70	3.70	3.66	3.57	0.29	0.24
	[0.57]	[0.69]	[0.64]	[0.76]		
Classifies child as underweight	0.01	0.01	0.01	0.01	0.94	0.77
Classifies child as healthy weight	0.56	0.52	0.56	0.55	0.94	0.80
Classifies child as overweight	0.14	0.13	0.10	0.11	0.75	0.52
Does not know weight classification	0.29	0.32	0.33	0.33	0.88	0.44
Child's school performance relative to peers [-2-2]	-0.01	-0.03	0.01	0.00	0.98	0.94
	[0.78]	[0.73]	[0.69]	[0.75]		
Happy with child's school performance [0/1]	0.62	0.63	0.73	0.76	0.01	0.07
Internet access at home [0/1]	0.39	0.37	0.46	0.41	0.56	0.63
Other children in experiment [0/1]	0.30	0.22	0.24	0.24	0.37	0.09
Response rate to baseline survey	0.67	0.65	0.66	0.67	NA	NA

Notes: Table presents means and standard deviations in brackets for continuous variables. For child's school performance relative to peers, a response of 0 indicates that the student's performance is average; below 0 is below average and above 0 is above average. P-values are from regressions of these characteristics on a treatment dummy [treatment=control] or the set of treatment dummies [all equal]; these regressions include randomization strata fixed effects based on the combination of weight status, school, and whether the baseline survey was completed. The fraction of parents who classify their child as obese is very close to 0 across all categories and therefore is omitted. All p-values with NA values are not defined since those are variables upon which randomization was stratified. Thus, as we include strata fixed effects in measuring the differences across groups, there is no within strata variation in these stratification variables.

Table 3: Parental Classification versus Actual Classification of Weight Status at Baseline

	Parental Classification				
Actual Classification	Underweight	Healthy weight	Overweight	Obese	Don't know
Underweight	27	38	0	1	0
	(41%)	(58%)	(0%)	(2%)	(0%)
Healthy weight	205	1,090	32	0	7
	(15%)	(82%)	(2%)	(0%)	(1%)
Overweight	2	240	113	1	6
	(<1%)	(66%)	(33%)	(<1%)	(2%)
Obese	0	52	189	14	2
	0%	(20%)	(74%)	(5%)	(1%)

Notes: Table shows the count in each category. Classifications along both dimensions are based on pre-treatment classifications. Percentages in parentheses represent percentages for each row (i.e., each row percentages add to 100%).

Table 4: Cross-Sectional Correlations Between Weight Status and Other Variables

	Weight Status at Baseline			
	Underweight	**Overweight**	**Obese**	**Correct Classification**
	(1)	(2)	(3)	(4)
Caretaker education: less than high school	0.003	-0.040	-0.054*	-0.031
	(0.010)	(0.027)	(0.024)	(0.027)
Caretaker education: high school	0.001	-0.016	-0.016	-0.006
	(0.009)	(0.024)	(0.023)	(0.023)
Male child	-0.016*	0.005	0.081**	0.003
	(0.008)	(0.018)	(0.015)	(0.018)
Internet access at home	-0.007	-0.036	0.037*	0.008
	(0.008)	(0.020)	(0.018)	(0.020)
Mother filled out the survey	0.029**	0.014	-0.062	0.001
	(0.006)	(0.052)	(0.052)	(0.055)
Father filled out the survey	0.035**	0.019	-0.035	0.037
	(0.009)	(0.054)	(0.054)	(0.057)
Caretaker present biased	0.000	-0.018	-0.005	0.049
	(0.011)	(0.025)	(0.022)	(0.026)
Caretaker future biased	-0.002	0.009	-0.059	0.020
	(0.019)	(0.048)	(0.032)	(0.048)
Caretaker always impatient	-0.003	-0.003	0.024	0.017
	(0.009)	(0.021)	(0.018)	(0.022)
Child in grade 2	0.038	-0.029	0.046	0.048
	(0.026)	(0.038)	(0.032)	(0.045)
Child in grade 3	-0.016	-0.009	0.055*	0.029
	(0.016)	(0.031)	(0.024)	(0.036)
Child in grade 4	-0.022	0.023	0.105**	0.035
	(0.016)	(0.032)	(0.025)	(0.035)
Child in grade 5	-0.023	0.059	0.045	0.044
	(0.016)	(0.032)	(0.023)	(0.036)
Observations	1,859	1,862	1,862	1,832
Dep. Var. Mean	0.03	0.18	0.13	0.62

Notes: Robust standard errors are presented in parentheses. * denotes statistical significance at the 5% level and ** at the 1% level. The omitted categories are caretaker education greater than high school, other than mother or father filled out the survey, female child, caretaker always patient, child in grade 6. Additionally, column (4) controls for weight classification.

Table 5: Sample Selection as a Function of Treatment

	Whether Responsed to Endline Survey	Whether Was Present for Endline Weight & Height Measurements
	(1)	(2)
Panel A: Overweight/Obese Sample		
Treatment	-0.065	0.003
	(0.039)	(0.022)
Observations	824	824
Dep. Var. Mean	0.633	0.923
Panel B: Healthy Weight Sample		
Treatment	-0.014	-0.008
	(0.025)	(0.015)
Observations	1,839	1,839
Dep. Var. Mean	0.564	0.917
Panel C: Underweight Sample		
Treatment	-0.007	-0.078
	(0.121)	(0.078)
Observations	83	83
Dep. Var. Mean	0.619	0.952

Notes: Robust standard errors are presented in parentheses. Regressions include age x sex fixed effects and strata fixed effects. Sample includes all subjects assigned to treatment (i.e., those with baseline height and weight measurements).

Table 6: Effects of Treatment on Behaviors/Outcomes - Overweight/Obese Sample

	Endline Survey Questions							Observed Behavior	Endline Measurements	
	Correct classification of child's weight	Child weighs too much?	Concern about child's weight	Number of actions taken	Any action taken?	Intend to have child eat less food	Intend to have child get more physical activity	Attend class	BMI	Weight (Kg)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample: Obese/Overweight										
Treatment	0.156**	0.122*	0.044	0.034	0.019	0.069	-0.018	0.002	0.199	0.144
	(0.046)	(0.049)	(0.093)	(0.168)	(0.026)	(0.049)	(0.018)	(0.033)	(0.184)	(0.535)
Observations	459	450	471	465	465	424	449	824	755	755
Dep. Var. Mean	0.267	0.581	3.387	2.197	0.934	0.718	0.983	0.204	21.38	43.35

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 child's weight, put child on a diet, had child skip meals, engaged in physical activity with child, and signed child up for sport/exercise class.

Table 7: Effects on Behaviors/Outcomes by Treatment Type - Obese/Overweight Sample

	Endline Survey Questions							Observed Behavior	Endline Measurements	
	Correct classification of child's weight	Child weighs too much?	Concern about child's weight	Number of actions taken	Any action taken?	Intend to have child eat less food	Intend to have child get more physical activity	Attend class	BMI	Weight (Kg)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
BASIC treatment	0.208**	0.135*	-0.022	0.044	0.029	0.045	-0.023	-0.008	0.139	0.012
	(0.059)	(0.060)	(0.112)	(0.205)	(0.030)	(0.059)	(0.026)	(0.039)	(0.185)	(0.601)
RISK treatment	0.121*	0.116*	0.008	0.024	0.033	0.046	-0.032	-0.005	0.160	0.396
	(0.057)	(0.059)	(0.113)	(0.203)	(0.030)	(0.060)	(0.026)	(0.040)	(0.186)	(0.604)
COMPARE treatment	0.141*	0.116*	0.139	0.034	-0.004	0.112	-0.001	0.020	0.066	-0.475
	(0.057)	(0.059)	(0.105)	(0.201)	(0.033)	(0.059)	(0.022)	(0.040)	(0.185)	(0.599)
Observations	459	450	471	465	465	424	449	824	755	755
Dep. Var. Mean	0.267	0.581	3.387	2.197	0.934	0.718	0.983	0.204	21.38	43.35

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 child's weight, put child on a diet, had child skip meals, engaged in physical activity with child, and signed child up for sport/exercise class.

Table 8: Heterogeneous Treatment Effects of COMPARE Treatment among Overweight and Obese

	Endline Survey Questions							Observed Behavior
	Correct classification of child's weight	Child weighs too much?	Concern about child's weight	Number of actions taken	Any action taken?	Intend to have child eat less food	Intend to have child get more physical activity	Attend class
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.099	0.379**	0.206	0.029	0.052	0.193	-0.013	0.017
	(0.140)	(0.142)	(0.221)	(0.431)	(0.096)	(0.180)	(0.056)	(0.104)
Treatment*Fraction Obese and Overweight in Class Between 25-36%	-0.044	-0.254	0.009	-0.048	-0.053	-0.038	0.009	-0.031
	(0.166)	(0.169)	(0.267)	(0.512)	(0.108)	(0.197)	(0.060)	(0.126)
Treatment*Fraction Obese and Overweight in Class More than 36%	0.066	-0.401*	-0.310	0.155	-0.127	-0.175	0.012	-0.008
	(0.178)	(0.193)	(0.298)	(0.575)	(0.111)	(0.208)	(0.069)	(0.129)
Observations	238	232	245	243	243	218	235	405
Dep Var Mean	0.267	0.581	3.387	2.197	0.934	0.718	0.983	0.204

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, engaged in physical activity with child, and signed child up for sport/exercise class. Sample includes only the control and the COMPARE treatment group.

Appendix Table 1: Baseline Characteristics - Overall Sample, Conditional on Filling Out Endline Survey

	Mean				P-value	
	Control	Basic	Risk	Compare	Treatment = Control	All equal
Panel A: Child Measurement						
	N=394	*N=355*	*N=405*	*N=381*		
Male	0.49	0.44	0.46	0.51	0.36	0.57
Age	9.77	9.76	9.80	9.82	0.85	0.64
	[1.14]	[1.19]	[1.25]	[1.18]		
BMI	18.13	18.25	18.23	18.42	0.30	0.08
	[3.41]	[3.61]	[3.47]	[3.43]		
Fraction Underweight	0.03	0.03	0.04	0.03	NA	NA
Fraction Healthy weight	0.65	0.65	0.68	0.65	NA	NA
Fraction Overweight	0.19	0.19	0.16	0.17	NA	NA
Fraction Obese	0.12	0.13	0.13	0.15	NA	NA
Panel B: Pre-Survey Responses by Primary Caretaker						
	N=290	*N=268*	*N=305*	*N=277*		
Primary Caretaker: Mother	0.67	0.69	0.68	0.63	0.48	0.99
Primary Caretaker: Father	0.30	0.30	0.30	0.33	0.72	0.75
Primary Caretaker: Other	0.03	0.02	0.02	0.03	0.37	0.35
Less than High School	0.34	0.39	0.32	0.31	0.15	0.68
High School	0.43	0.41	0.43	0.45	0.69	0.77
More than High School	0.23	0.20	0.25	0.24	0.55	0.82
Concern about H1N1 [1-4]	3.33	3.21	3.26	3.29	0.29	0.21
	[0.78]	[0.78]	[0.79]	[0.75]		
Concern about child's weight [1-4]	3.19	3.09	3.00	3.13	0.08	0.04
	[0.92]	[1.01]	[1.00]	[0.95]		
Concern about own weight [1-4]	3.08	2.99	2.98	3.05	0.52	0.26
	[0.93]	[1.04]	[1.00]	[0.90]		
Concern about child's school performance [1-4]	3.76	3.65	3.64	3.64	0.05	0.00
	[0.55]	[0.70]	[0.69]	[0.65]		
Classifies child as underweight	0.03	0.02	0.01	0.03	0.47	0.60
Classifies child as healthy weight	0.54	0.57	0.56	0.57	0.36	0.41
Classifies child as overweight	0.06	0.06	0.05	0.06	0.71	0.29
Does not know weight classification	0.38	0.34	0.37	0.33	0.96	0.93
Child's school performance relative to peers [-2-2]	-0.03	-0.04	-0.03	-0.05	NA	0.88
	[0.76]	[0.77]	[0.69]	[0.71]		
Happy with child's school performance [0/1]	0.67	0.70	0.68	0.73	0.28	0.33
Internet access at home [0/1]	0.38	0.34	0.38	0.37	0.79	0.60
Other children in experiment [0/1]	0.31	0.29	0.25	0.26	0.12	0.06
Response rate to baseline survey	0.74	0.75	0.76	0.73	0.20	0.26

Notes: Table presents means and standard deviations in brackets for continuous variables. For child's school performance relative to peers, a response of 0 indicates that the student is average; below 0 is below average and above 0 is above average. P-values are from regressions of these characteristics on a treatment dummy [treatment=control] or the set of treatment dummies [all equal]; these regressions include randomization strata fixed effects based on the combination of weight status, school, and whether the baseline survey was completed. The fraction of parents who classify their child as obese is very close to 0 across all categories and therefore is omitted. All p-values with NA values are not defined since those are variables upon which randomization was stratified. Thus, as we include strata fixed effects in measuring the differences across groups, there is no within strata variation in these stratification variables.

Appendix Table 2: Baseline Characteristics - Overweight and Obese, Conditional on Filling Out Endline Survey

	Mean				P-value	
	Control	**Basic**	**Risk**	**Compare**	**Treatment = Control**	**All equal**
Panel A: Child Measurement						
	N=124	*N=112*	*N=115*	*N=121*		
Male	0.61	0.48	0.55	0.59	0.26	0.16
Age	9.74	9.72	9.83	9.85	0.83	0.52
	[1.03]	[1.04]	[1.15]	[1.07]		
BMI	22.10	22.44	22.48	22.46	0.69	0.40
	[2.54]	[2.90]	[2.69]	[2.46]		
Fraction Overweight	0.61	0.59	0.55	0.53	NA	NA
Fraction Obese	0.39	0.41	0.45	0.47	NA	NA
Panel B: Baseline Survey Responses by Primary Caretaker						
	N=91	*N=85*	*N=85*	*N=85*		
Primary Caretaker: Mother	0.72	0.68	0.63	0.55	0.11	0.09
Primary Caretaker: Father	0.25	0.32	0.35	0.42	0.12	0.04
Primary Caretaker: Other	0.03	0.00	0.02	0.03	0.07	0.44
Less than High School	0.34	0.28	0.29	0.17	0.00	0.02
High School	0.40	0.44	0.42	0.47	0.72	0.44
More than High School	0.26	0.29	0.29	0.36	0.25	0.16
Concern about H1N1 [1-4]	3.32	3.16	3.37	3.36	0.18	0.92
	[0.85]	[0.75]	[0.78]	[0.80]		
Concern about child's weight [1-4]	3.26	3.29	3.28	3.29	0.99	0.97
	[0.86]	[0.87]	[0.88]	[0.83]		
Concern about own weight [1-4]	3.05	3.09	3.09	3.15	0.87	0.66
	[0.98]	[1.02]	[0.98]	[0.86]		
Concern about child's school performance [1-4]	3.75	3.71	3.68	3.62	0.44	0.21
	[0.51]	[0.70]	[0.62]	[0.70]		
Classifies child as underweight	0.02	0.02	0.01	0.01	0.92	0.85
Classifies child as healthy weight	0.57	0.54	0.54	0.59	0.85	0.85
Classifies child as overweight	0.11	0.15	0.09	0.13	0.77	0.82
Does not know weight classification	0.30	0.29	0.36	0.27	0.59	0.92
Child's school performance relative to peers [-2-2]	-0.04	0.02	0.05	0.03	0.61	0.23
	[0.79]	[0.77]	[0.61]	[0.71]		
Happy with child's school performance [0/1]	0.64	0.67	0.78	0.75	0.07	0.09
Internet access at home [0/1]	0.39	0.40	0.44	0.43	0.92	0.54
Other children in experiment [0/1]	0.27	0.21	0.26	0.21	0.70	0.27
Response rate to baseline survey	0.73	0.76	0.74	0.70	NA	NA

Notes: Table presents means and standard deviations in brackets for continuous variables. For child's school performance relative to peers, a response of 0 indicates that the student is average; below 0 is below average and above 0 is above average. P-values are from regressions of these characteristics on a treatment dummy [treatment=control] or the set of treatment dummies [all equal]; these regressions include randomization strata fixed effects based on the combination of weight status, school, and whether the baseline survey was completed. The fraction of parents who classify their child as obese is very close to 0 across all categories and therefore is omitted. All p-values with NA values are not defined since those are variables upon which randomization was stratified. Thus, as we include strata fixed effects in measuring the differences across groups, there is no within strata variation in these stratification variables.

Appendix Table 3: Effects of Treatment on Behaviors/Outcomes among Healthy Weight and Underweight

	Endline Survey Questions							Observed Behavior	Endline Measurements	
	Correct classification of child's weight	Child weighs too much?	Concern about child's weight	Number of actions taken	Any action taken?	Intend to have child eat less food	Intend to have child get more physical activity	Attend class	BMI	Weight (Kg)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample: Healthy Weight										
Treatment	0.114**	-0.015	-0.032	0.091	0.033	-0.018	0.019	-0.056**	0.031	-0.059
	(0.029)	(0.013)	(0.071)	(0.073)	(0.028)	(0.031)	(0.023)	(0.020)	(0.107)	(0.295)
Observations	968	963	1,005	993	993	854	953	1,839	1,636	1,636
Dep. Var. Mean	0.791	0.033	3.148	1.227	0.821	0.203	0.883	0.178	16.24	30.83
Sample: Underweight										
Treatment	0.119	0.000	0.045	-0.049	-0.094	0.057	0.069	0.111	0.069	-0.166
	(0.188)	(0.000)	(0.250)	(0.325)	(0.124)	(0.095)	(0.089)	(0.094)	(0.260)	(0.794)
Observations	52	50	53	51	51	47	48	83	71	71
Dep. Var. Mean	0.538	0	3.385	1.308	0.923	0.077	0.923	0.143	13.04	23.61

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 child's weight, put child on a diet, had child skip meals, engaged in physical activity with child, and signed child up for sport/exercise class.

Appendix Table 4: Effects of Treatment on Behavior and BMI among Overweight and Obese

	Endline Survey Questions						
	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**	**Engaged in physical activity with child**	**Signed child up for sport/exercise class**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	0.031	0.095	0.078	-0.038	-0.070	-0.064	0.002
	(0.056)	(0.053)	(0.041)	(0.033)	(0.039)	(0.053)	(0.043)
Observations	465	465	465	465	465	465	465
Dep. Var. Mean	0.402	0.541	0.139	0.107	0.172	0.648	0.189

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.

Appendix Table 5: Post-Survey-Pre-Survey Differences for Overweight and Obese in Control Group

	Classify child's weight correctly	Child weighs too much?	Concern about child's weight
	(1)	(2)	(3)
Difference	0.020	0.041	0.152
	(0.028)	(0.043)	(0.081)
Mean at Baseline	0.28	0.56	3.41
Observations	102	98	105

Notes: Robust standard errors are presented in parentheses. Estimates come from the regression of the difference in post-intervention and pre-intervention survey measures on a constant. The reported coefficient estimate is the intercept.

Appendix Table 6: Overall Effects of Treatment on Behavior and BMI for Sample of Lone Overweight and Obese Children

	Endline Survey Questions							Observed Behavior	Endline Measurements	
	Correct classification of child's weight	Child weighs too much?	Concern about child's weight	Number of actions taken	Any action taken?	Intend to have child eat less food	Intend to have child get more physical activity	Attend class	BMI	Weight (Kg)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	0.118*	0.099	-0.037	0.150	0.035	0.028	-0.031	0.034	0.288	0.198
	(0.059)	(0.062)	(0.112)	(0.197)	(0.034)	(0.063)	(0.023)	(0.047)	(0.208)	(0.592)
Observations	291	287	298	294	294	268	282	464	429	429
Dep. Var. Mean	0.276	0.547	3.436	2.115	0.923	0.729	0.987	0.217	21.13	42.73

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 child's weight, put child on a diet, had child skip meals, engaged in physical activity with child, and signed child up for sport/exercise class.

Baseline Survey

***Primary School*_____*Grade* |____| *Class* |____|**

Survey

This survey seeks to collect information from parents about their children. It will enable us to carry out a study, the results from which we will share afterwards.

We ask that the primary caretaker of this child fill out the survey and return it to school with your child before <u>January 19, 2010.</u>

1. **Please write YOUR first name and last names in CAPITAL LETTERS.**

   First Name:_____ Last Names:_____ _____

2. **Please write the name of your CHILD in CAPITAL LETTERS. All of the questions in this survey that refer to "your child," should be answered with respect to THIS child.**

   First Name:_____ Last Names:_____ _____

3. **What is your relationship to this child?**

   ___Father ___Grandfather ___Brother
   ___Mother ___Grandmother ___Sister ___Other:_____

4. **Are you the primary caretaker of this child?**

   ___Yes ___No

5. **What is the highest level of education YOU have reached? Please DRAW A CIRCLE around the highest level achieved.**

School Level	Grade
Primary	**1 2 3 4 5 6**
Secondary	**1 2 3**
High School	**1 2 3**
Technical Career	•
Bachelors Degree	•
Masters/Doctorate/Professional	•
Other	**Which:**
Without Studies	•

6. **What is your profession?**

   ___Agricultural laborer ___Work in the home
   ___Non-agricultural laborer ___Union worker
   ___Self-employed worker ___Unemployed
   ___Supervisor ___Other

Please continue on to the next page

We are now going to ask you a few questions about your concerns related to certain issues.

7. How would you rate your concern about <u>the H1N1 flu</u>?

___Not concerned
___Somewhat concerned
___Moderately concerned
___Very concerned

8. How would you rate your concern about <u>your child's weight</u>?

___Not concerned
___Somewhat concerned
___Moderately concerned
___Very concerned

9. How would you rate your concern about <u>your own weight</u>?

___Not concerned
___Somewhat concerned
___Moderately concerned
___Very concerned

10. How would you rate your concern about <u>your child's performance in school</u>?

___Not concerned
___Somewhat concerned
___Moderately concerned
___Very concerned

We are now going to ask you a few questions about your child.

11. How would you classify your child's weight?

___Underweight
___Healthy weight
___Overweight
___Obese
___Don't know

12. How would you characterize your child's weight?

___Weighs much too little
___Weighs too little
___Weighs just enough
___Weighs too much
___Weighs much too much
___Don't know

Please continue on to the next page

13. How would you classify the weight of most of the children in your child's class?

___Underweight
___Healthy weight
___Overweight
___Obese
___Don't know

14. In terms of school performance, how would rate your child's performance relative to his/her peers?

___Much below average
___Somewhat below average
___Average
___Moderately above average
___Much above average

15. Are you happy with your child's performance in school?

___Yes ___No

16. Do you have a computer with internet at home?

___Yes ___No

17. Do you have any OTHER children enrolled in this school?

___Yes ___No

18. If yes, please write the grade, class number and the children's first name and last names.

Grade: ___ Class:___ First Name: _____ Last Names:_____
Grade: ___ Class:___ First Name: _____ Last Names:_____
Grade: ___ Class:___ First Name: _____ Last Names:_____

Please continue on to the next page

The next set of questions ask you how you would react to some imaginary situations. You will be asked to pick the option you would prefer. Please react as if the situations were real. It is very important that you try to give accurate and honest answers to these questions. Your answers will help us understanding how people make decisions.

Suppose you win the lottery today. The lottery administrator gives you options for how you would like to accept your cash prize.

Option 1: Accept a cash prize today
Option 2: Accept a larger cash prize but with a one month delay.

19. Do you prefer a 500 peso prize guaranteed today or a 625 peso prize guaranteed 1 month from now?

___500 pesos today
___625 pesos in 1 month

20. If the prize money changed, do you prefer a 500 peso prize guaranteed today or a 750 peso prize guaranteed 1 month from now?

___500 pesos today
___750 pesos in 1 month

21. If you answered 500 pesos for both questions 19 & 20, how much would the prize have to be for you to choose to wait?

_____

Now imagine that the option would be to accept the lottery cash prize six months from now, or to accept a larger cash prize seven months from now. Please make your decisions based on how you expect you would answer if the choice were actual and not hypothetical.

22. Do you prefer 500 peso prize guaranteed 6 months from now, or a 625 peso prize guaranteed 7 months from now?

___500 pesos in 6 months
___625 pesos in 7 months

23. If the prize money changed, do you prefer a 500 peso prize guaranteed 6 months from now, or a 750 peso prize guaranteed 7 months from now?

___500 pesos in 6 months
___750 pesos in 7 months

24. If you answered 500 pesos for both questions 22 & 23, how much would the prize have to be for you to choose to wait?

_____

MANY THANKS!

Parent Signature:_____ Date:_____

Endline Survey

***Primary School*_____*Grade* |____| *Class* |____|**

Follow-up Survey

About a month ago, you or another member of your household received a survey collecting information from families about their children. The survey below is a further survey.

It would be greatly appreciated if the same person who answered the first survey could answer this new survey as well. If your household never received the first survey, it would be greatly appreciated if the primary caretaker could complete this survey.

The information collected will be used to carry out a study, the results of which will be shared afterwards.

1. **Please write YOUR first name and last names in CAPITAL LETTERS.**

   First Name:_____ Last Names:_____ _____

2. **Please write the name of your CHILD in CAPITAL LETTERS. All of the questions in this survey that refer to "your child," should be answered with respect to THIS child.**

   First Name:_____ Last Names:_____ _____

3. **What is your relationship to this child?**

   ___Father ___Grandfather ___Brother
   ___Mother ___Grandmother ___Sister ___Other:_____

4. **Are you the primary caretaker of this child?**

   ___Yes ___No

We are now going to ask you a few questions about your concerns related to certain issues.

5. **How would you rate your concern about <u>the H1N1 flu</u>?**

   ___Not concerned
   ___Somewhat concerned
   ___Moderately concerned
   ___Very concerned

6. **How would you rate your concern about <u>your child's weight</u>?**

   ___Not concerned
   ___Somewhat concerned
   ___Moderately concerned
   ___Very concerned

Please continue on to the next page

7. How would you rate your concern about <u>your own weight</u>?

___Not concerned
___Somewhat concerned
___Moderately concerned
___Very concerned

8. How would you rate your concern about <u>your child's performance in school</u>?

___Not concerned
___Somewhat concerned
___Moderately concerned
___Very concerned

We are now going to ask you a few questions about your child.

9. How would you classify your child's weight?

___Underweight
___Healthy weight
___Overweight
___Obese
___Don't know

10. How would you characterize your child's weight?

___Weighs much too little
___Weighs too little
___Weighs just enough
___Weights too much
___Weighs much too much
___Don't know

11. How would you classify the weight of most of the children in your child's class?

___Underweight
___Healthy weight
___Overweight
___Obese
___Don't know

12. In terms of school performance, how would you rate your child's performance relative to his/her peers?

___Much below average
___Somewhat below average
___Average
___Moderately above average
___Much above average

Please continue on to the next page

13. During the last month, have you done any of the following activities? Mark all that apply.

___Discussed your child's weight with family members or friends
___Seen a doctor, a nurse, or nutritionist in regards to your child's weight
___Put your child on a diet
___Had your child skip meals or snacks
___Encouraged your child to increase physical activity
___Engaged in physical activity with your child
___Signed your child up for a sport or exercise class
___Discussed your child's weight with him or her

14. What are your intentions related to your child's physical activity in the near future?

___I intend to have him or her get less physical activity.
___I intend to have him or her get more physical activity.
___I intend to have him or her not change his or her amount of physical activity.

15. What are your intentions related to the amount of food your child eats in the near future?

___I intend to have him or her eat less.
___I intend to have him or her eat more.
___I intend to have him or her not change his or her amount of food he or she eats.

16. An obese person is

___a person who does not exercise
___a person who exercises
___a person who likes fatty foods
___a person who does not like fatty foods
___a person who weighs less than the healthy level
___a person who weighs more than the healthy level
___I do not know.

17. Being overweight or obese increases one's risk of cancer.

___Yes
___No
___I do not know.

18. Being overweight or obese increases one's risk of the H1N1 flu.

___Yes
___No
___I do not know.

19. Being overweight or obese increases one's risk of asthma.

___Yes
___No
___I do not know.

Please continue on to the next page

20. Which of the following is a cause of obesity?

___Bad joints
___Eating fruits and vegetables
___Eating too little
___Lack of exercise

21. What is the recommended amount of physical activity for children according to The Institución Nacional de Salud Pública?
If you do not know the correct answer, select the one that seems most reasonable to you.

___10 minutes per day
___30 minutes per day
___45 minutes per day
___60 minutes per day
___90 minutes per day

22. Would a session on practical tips for improving your child's eating habits and physical activity be of value to you and your child?

___Yes
___No

23. Did you receive a report of your child's height and weight from his or her school in the last month?

___Yes
___No

24. If you have any comments or suggestions, please let us know here. Thanks.

MANY THANKS!

Parent Signature:_____ Date:_____

February 8, 2010

Dear Parents or Guardians:

Recently, your child's height and weight were measured at school. Together, height, weight, age and gender can be used to determine whether a child is underweight, healthy weight, overweight, or obese. Some children in Puebla have health problems caused by their weight, so it is important to know your child's weight. As you review the results, remember:

- These results are for screening purposes only. Check with your pediatrician for a full evaluation and referral.

- Please do not put your child on a weight loss/gain diet. Work with a doctor to find the right strategies for your family.

If you have any questions, you can contact nutritionist Georgina Salgado Ramírez free of charge, at phone number 2221 40 52 37 (Mondays and Wednesdays from 1 to 7 in the afternoon, and Tuesdays, Thursdays and Fridays between 10 in the morning and 4 in the afternoon). At the same number, you can leave a message with your name and number, and she will return your call. Alternatively, you can send her an email at: geosalram11@gmail.com.

Sincerely,

Lic. Arturo Malpica Padierna

Responsable de Proyectos con Tecnología

Centro de Tecnología Educativa del Estado de Puebla

Basic Report Card

Recently, (child's name) height and weight were measured at school.

Height: _____ cm

Weight: _____ kg

According to this information, your child is (**weight classification**).

		Condition	Weight
		Underweight	A-AA
Your child is here	➡	Healthy weight	B-BB
		Overweight	C-CC
		Obese	D-DD

You are invited to a class, "Practical Tips for Improving Your Child's Eating Habits and Physical Activity."

The class is free. Choose the date and time that works best for you.

Wednesday, (date) at 8:15 am at (the school)

Friday, (date) at 8:15 am at (the school)

Risk Report Card

Recently, (child's name) height and weight were measured at school.

Height: _____ cm

Weight: _____ kg

According to this information, your child is (**weight classification**).

Obese/overweight [EITHER OBESE OR OVERWEIGHT SHOWS BUT NOT BOTH] children are at higher risk of living shorter lives and developing diseases such as diabetes, high blood pressure, heart disease, asthma, and cancer.

		Condition	Weight
		Underweight	A-AA
Your child is here	➡	Healthy weight	B-BB
		Overweight	C-CC
		Obese	D-DD

You are invited to a class, "Practical Tips for Improving Your Child's Eating Habits and Physical Activity."

The class is free. Choose the date and time that works best for you.

Wednesday, (date) at 8:15 am at (the school)

Friday, (date) at 8:15 am at (the school)

Compare Report Card

Recently, (child's name) height and weight were measured at school.

Height: _____ cm

Weight: _____ kg

According to this information, your child is (**weight classification**).

In your child's class, out of () children,
- () children are **underweight.**
- () children are **healthy weight.**
- () children are **overweight.**
- () children are **obese.**

Your child is here 

Condition	Weight
Underweight	A-AA
Healthy weight	B-BB
Overweight	C-CC
Obese	D-DD

You are invited to a class, "Practical Tips for Improving Your Child's Eating Habits and Physical Activity."

The class is free. Choose the date and time that works best for you.

Wednesday, (date) at 8:15 am at (the school)

Friday, (date) at 8:15 am at (the school)

Control

You are invited to a class, “Practical Tips for Improving Your Child’s Eating Habits and Physical Activity.”

The class is free. Choose the date and time that works best for you.

Wednesday, (date) at 8:15 am at (the school)

Friday, (date) at 8:15 am at (the school)