

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF NUTRITIONAL SCIENCES

RESTRICTING ACCESS TO PALATABLE SNACK FOODS: PARENTS' AND CHILDREN'S
PERSPECTIVES OF RESTRICTIVE FEEDING PRACTICES IN THE HOME

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Spring 2012

A thesis submitted in partial fulfillment of the requirements for a baccalaureate degree in Nutritional
Sciences with honors in Nutritional Sciences

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ABSTRACT

Research suggests that parents' use of restriction may impede children's ability to self-regulate their intake and may increase eating in the absence of hunger (EAH), which are behaviors that promote excessive weight gain. Though much research has examined parent-reports of restriction using continuous measures like the Child Feeding Questionnaire (CFQ), little is known about the types of restrictive feeding strategies that parents employ, which may provide a better picture of restriction as it occurs in the home environment. In addition, very little is also known about child perceptions of restriction and how parent and child reports of restriction correlate. The purpose of this cross-sectional study was to describe parents' use of restrictive feeding practices as reported by the parents and their 3-to-5- year old children, and to examine how these practices differ across eight snack foods (graham crackers, vanilla wafers, cheese crackers, butter crackers, goldfish crackers, pretzel crackers, chocolate kisses, and marshmallows). This study also examined how parents' reports of restrictive feeding practices correlated with their child's reports of restriction. Parent reports of restrictive feeding practices were assessed using the Child Feeding Questionnaire and the Restricted Access Questionnaire. Child reports of parental restriction were measured using the kid's version of the Child Feeding Questionnaire (KCFQ) and a short survey similar to the Restricted Access Questionnaire (conducted via interview). Across all study snack foods, parents required their child to ask permission to eat 88% of the foods and limited how much their child could eat of 69% of the foods. They also limited second helpings for 38% of the foods, intentionally limited bringing 48% of the foods into the home, and kept 42% of the foods out of their child's reach. Children indicated that parents chose how much they can eat for 67% of the study foods and that their parents would be upset if they ate 70% of the foods without asking permission. Parents and children also similarly reported that parents allowed access to most of the foods during snack

time. Snacks classified as “candy”, including chocolate and marshmallows, were consistently more restricted than the remaining six, cracker-like foods. Results revealed that the overall use of restriction reported by parents and their children via the CFQ and KCFQ were not associated ($r=0.053$, $P=0.79$). There were, however, positive correlations between parent and child reports of restriction using the more food-specific Restricted Access Questionnaire and child restriction interview. In conclusion, we found that parents more frequently utilized the practice of requiring children to ask permission to access snack foods and limiting how much children could eat. In addition, parents were more restrictive with candy than with crackers. No correlation was observed with continuous measures of restriction, indicating that instruments may be assessing different constructs, i.e. different degrees and styles of restriction, and motives for restriction. Future research is needed to replicate our findings in a larger sample and examine the effects of different types of restrictive feeding practices on children’s BMI and eating behaviors.

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ACKNOWLEDGEMENTS

Firstly, I would like to thank Dr. Patterson. During our conversations over the past year, she has passed on a great deal of advice from her professional and personal experiences. I greatly appreciated the concern and guidance she has offered. In addition, her class played an integral role in sparking my interest in child eating behaviors and many other fields of the nutrition literature.

This thesis would not be possible without the entire faculty and staff at the Center for Childhood Obesity Research (CCOR), specifically Dr. Birch, Dr. Savage, and Brandi Rollins. I would like to thank Dr. Birch, the Director of CCOR. It has been an honor to work with someone so prominent in the restriction and child feeding practices fields. The methods and aims of this paper would not have been possible without her findings.

I would also like to thank Dr. Savage, who is the Associate Director at CCOR. Dr. Savage warmly welcomed me into CCOR in the summer of 2011. Throughout the entire process, Dr. Savage was always more than willing to offer her knowledge and help. This project would not be what it is today if it were not for Dr. Savage and the motivation and valuable insight that she provided me.

I would also like to thank Brandi Rollins. Brandi enthusiastically welcomed me into her study even though in doing so, she took on a major, year-long time commitment. She was there from start to finish, from aims and hypotheses to discussions and conclusions. She warmly welcomed me into her home and office for hours at a time. She continuously challenged me to do my best and expected that every day my best would get better. In addition, if I was ever feeling discouraged, Brandi was able to pick me up with her jokes, laughter, and encouragement.

Finally, I would like to thank my parents, sisters, friends, and the Schreyer Honors College faculty and staff for their encouragement throughout the entire process. Specifically, I would like to thank my parents for their unending support and the sacrifices they have made to ensure that I can have the best education possible, and my sisters for always setting exceedingly high expectations for me to follow.

Introduction

Infants are born with an innate ability to recognize and appropriately respond to internal cues for hunger and fullness (Fox, Devaney, Reidy, Razafindrakoto, & Ziegler, 2006; Birch, Johnson, Andersen, Peters, & Schulte, 1991). As children develop and learn about food and eating, this ability to self-regulate energy intake tends to weaken, and eating can be increasingly influenced by external signals in the physical environment (Rolls, Engell, & Birch, 2000) such as parents' use of controlling feeding behaviors. Parents serve as the gatekeeper in the home; they decide which foods are brought into the home as well as when and how much of these foods their child can consume. However, parents' use of controlling feeding strategies like restricting children's access to palatable snacks has been shown to increase children's selection, intake of, positive comments about, and requests for the restricted food (Fisher and Birch, 1999). In addition, restriction is thought to impede children's self-regulation of intake (Birch, McPhee, Shoba, & Steinberg, 1987) and is linked to increased eating in the absence of hunger (EAH) (Joyce & Zimmer-Gembeck, 2009; Birch, Fisher, Davison, 2003), decreased inhibitory control and behavioral self-regulation (Anzman & Birch, 2009; Tan & Holub, 2011), and decreased ability to delay gratification (Seeyave et al., 2009; Center on an Aging Society, 2002) – all of which are risk factors for the development of childhood obesity. However, to date, there is limited research on the types of restrictive feeding practices that parents employ. Some feeding strategies may be more effective and promote healthier eating behaviors than others. In addition, most studies to date have used parent reports of restriction while only a few have used child reports; yet it is unclear whether parent and child measures of restriction are related.

Food restriction is a multidimensional construct that varies in degree and style among parents. For example, restriction can refer to limiting a child's intake and access to palatable

foods, limiting which snack foods enter the home, requiring permission to access these foods, or keeping these foods out of reach. To date, however, most studies on restriction have used the Child Feeding Questionnaire (CFQ), a more global measure of parents' restrictive feeding practices. It is possible that this measure may only provide a partial picture of restriction. Different types of restrictive feeding practices may differentially influence a child's eating behaviors and diet quality. For example, limiting the availability of a snack food, i.e. limiting how often the food is brought into the child's environment, may positively affect a child's eating habits. In a cross-sectional study, Gonzalez, Jones, and Frongillo (2009) examined the relation between the availability of palatable snack foods in schools (via vending machines, snack bars, or as a la carte items) and 5th grader's intake of fruits and vegetables. Children in schools that did not offer palatable snacks during school hours had significantly higher intakes of fruits and vegetables than children who attended schools where one or more palatable snack foods were readily available. In contrast, limiting *access* to palatable foods, i.e. the food is available in the home but off-limits to the child in terms of when or how much they can eat, has been found to negatively affect children's eating behaviors. Birch and Fisher (1999) found that restricting children's access to palatable foods increased children's selection and consumption of the restricted food and that children made more positive comments about, requests for, and efforts to obtain this food. Taken together, knowing which types of restrictive feeding strategies are being used by parents can be more informative than looking at continuous, global restriction. In addition, global restriction measures may overlook situations where parents use one type of restriction practice (e.g. limited access) and not others (e.g. availability).

Child perceptions of the type of parental restrictive feeding practices are also not well known. Most studies to date have used parent reports to measure restriction. However, this may be an incomplete picture of restriction. Children are the ones who actually experience their parents' restrictive feeding strategies. In addition, children's reports may be less influenced by social desirability bias than parent reports. Currently, it is not clear how parent measures of restriction relate to child perceptions of restriction. Only one study has examined the relationship between parental reports of restriction and child reports of restriction (Fisher & Birch, 1999). In this study, Fisher and Birch found a high correlation between maternal reports of restriction and their daughters' reports of restriction ($r=0.59$), but no correlation between maternal reports and their sons' reports. By comparing parent and child measures of restriction, we could determine if children are able to perceive the type and degree of restrictive strategies that their parents are employing. In addition, if a positive correlation is observed between parent and child reports of restriction, this could validate existing parent and child measures of restriction.

The purpose of this paper was two-fold: 1) to describe different types of restrictive feeding practices as reported by Central Pennsylvanian parents and their 3-to-5-year old children, and 2) to investigate whether parent and child reports of restriction correlate. In order to better understand parents' use of restriction, there is a need to first identify the frequency of use of distinct restrictive practices, as reported by parents and children, and then determine how these strategies differ by food. For aim 1, data from parents were obtained using the Restricted Access Questionnaire (Fisher & Birch, 1999) and data from children were obtained using a brief interview (Fisher & Birch, 1999) designed to measure similar aspects of parental restriction of the snack foods. To address aim 2, the latter two measures and the child and parent versions of the Child Feeding Questionnaire were employed. This allowed us to correlate the well-used

parent CFQ with child perceptions of restriction, as measured by the child version of the CFQ (KCFQ). In addition, we also correlated types of restriction practices (represented as subscales) that were reported on the parent's Restricted Access Questionnaire and during the child's restriction interview.

Study Aims

Aim 1: To describe different types of parental restrictive feeding practices, as reported by both parents and children, using the Restricted Access Questionnaire as the parent measure and a restriction interview as the child measure. The frequencies with which different restrictive feeding strategies are used will be examined across eight palatable study foods and by all eight study foods (**Table 1**). In addition, we will describe the presence of these snack foods in the home.

Aim 2: To determine if parents' reports of restrictive feeding practices are related to children's reports of parental food restriction by comparing parent and child reports of restriction via the parent and child versions of the Child Feeding Questionnaire and the Restricted Access Questionnaire.

Hypothesis 1: Based on findings from Fisher and Birch (1999), we expect that a moderate correlation will be observed between parent and child reports of restriction.

Methods

Participants

Subjects were 45 3- to 6-year old children attending a university-based, full-day daycare in University Park, Pennsylvania, and their parents. The subjects were a part of a larger experimental child feeding study that examined the effects of restricting children's access to palatable snack foods. Exclusion criteria included having a health condition that impacted food intake and known food allergies. Forty-five children from five classrooms were recruited. Parents provided consent for their family's participation. The children's mother or father was asked to complete a brief survey consisting of measures on household demographics, parent height and weight, and parental restrictive feeding practices. During the middle of the study, parents were asked to complete another brief survey consisting of multiple measures of child feeding practices. Parents were compensated \$10 for their family's participation and each classroom received \$50.

Children were not included in the current paper if they had missing data on the variables of interest ($n = 2$); difficulty completing the interviews due to language barriers ($n = 3$) or behavioral problems ($n = 3$); or parents who did not complete both parent surveys ($n = 5$) or who reported that they never purchased any of the study foods ($n = 2$). The final sample size was reduced to 30 (11 boys, 19 girls). Of these child-parent dyads, all but 7 of the parent surveys were completed by mothers. The average BMI of the mothers and fathers were 23.2 and 27.0, respectively (**Table 2**). Over two-thirds of the families reported a combined annual income of \$100,000+; 21% had an income range between \$41,000- \$100,000, and the remaining 10% had a combined income of \$21,000-\$40,000. Over 90% of the parents had received an undergraduate degree or higher.

Measures

Parent- report of parental restrictive feeding practices. Parents' reports of child feeding practices were assessed using the parent-version of the Child Feeding Questionnaire (CFQ) (**Table 3**) and the Restricted Access Questionnaire (**Table 4**). The CFQ assesses dimensions of parental control in child feeding and factors that may elicit parental control (Birch, Fisher, Grimm-Thomas, Markey, Sawyer, & Johnson, 2001). The measure is based on Costanzo and Woody's (1985) model of domain specific parenting. For the purposes of this study, only the restriction subscale was utilized, which assesses the extent to which parents restrict their child's access to snack foods (8-items; e.g., "*I intentionally keep some foods out of my child's reach*"). Items were measured using a 5-point Likert-type scale. The Restricted Access Questionnaires, developed by Fisher and Birch (1999), measures the extent to which parents limit children's access to the same eight snack foods described above (i.e. graham crackers, cheese crackers, pretzel crackers, butter crackers, goldfish crackers, vanilla wafers, marshmallows, and chocolate).

Children's report of parental restrictive feeding practices. Children's reports of parental restriction were measured using the kid's version of the Child Feeding Questionnaire (KCFQ) (**Table 5**) and a short survey similar to the Restricted Access Questionnaire (**Table 6**). The KCFQ is based on the parent CFQ (Birch, Fisher, Grimm-Thomas, Markey, Sawyer, & Johnson, 2001) and was developed to assess children's perceptions of the level of parental control exerted during feeding situations. From the KCFQ, we utilized the subscale for perceived maternal restriction (5 items) and paternal restriction (5 items), i.e. the children's perception of the degree to which their mother (or father) attempts to restrict or limit their access to foods (e.g., "*If you ask for a snack, does mommy let you have it?*"). Children responded "no", "sometimes", or "yes"

to each question. In addition, children's perceived restricted access to eight types of snack foods (graham crackers, pretzel crackers, cheese crackers, butter crackers, goldfish crackers, vanilla wafers, chocolate, and marshmallows) was assessed via a brief interview preceding the administration of the kid's CFQ. For each of the eight snack foods, children were asked "*Does your mom/dad let you have [snack food]?*" If the child answered "yes," s/he was asked "*Is that an anytime food, a snack food, a dessert food, or a special time food* (responses: 4=no, 3=special time, 2= dessert, 1=snack, 0=anytime). Children were also asked "*Does your mom/dad let you choose how much of the [snack food] you can eat, or do you choose?*" (1=parent chooses, 0=child chooses), and "*Would your parents be upset if you ate the [snack food] without asking?*" (1=yes, 0=no).

Statistical Analysis

All descriptives and data analyses were completed using SAS version 9.1 (SAS Institute Inc., Cary, NC, USA).

Aim 1 of the current paper was to describe different types of parental restrictive feeding practices, as reported by both parents and children. To investigate aim 1, frequencies of parent responses on the Restrictive Feeding Questionnaire were computed. The latter was done across the eight foods and for each of the eight foods. This was repeated for the child responses on the restriction interview.

Aim 2 was to determine if parents' reports of restrictive feeding practices were associated with children's reports of parental food restriction. To investigate aim 2, a Pearson correlation was run between parent and child reports on the respective parent- and child-versions of the CFQ. In addition, subscales on the parent Restrictive Feeding Questionnaire were correlated with similar subscales from the child restriction interview. Specifically, the parent subscale for "*When*

do you allow your child to have the [snack food]?” was correlated with the similarly structured “*When does your mommy/daddy let you have the [snack food]?”* Both questions had the same set of responses. In addition, the parent subscales for “*At home, do you generally limit how much of the [snack food] your child is allowed to have?”* and “*Is your child allowed to have second helpings of the [snack food]?”* were correlated with child subscale for “*Does your mommy/daddy let you choose how much of the [snack food] you can eat, or do they choose?”*”

Results

Sample demographics

As shown in Table 2, children ranged from 3.3 to 5.8 years of age. Approximately 15% of the children were overweight. Children averaged in the 54th weight-for-age percentile and their mean BMI was 15.47, indicating that the majority of children in the study were at a healthy weight. The majority of the children were white (78%) and slightly more than half were female (~59%).

Presence of study foods in the home

In preparation for the study aims, frequencies were run to describe the presence of the eight study snack foods in the home. Across the snack foods, parents reported that 56% of the foods were *never* or *rarely* in the home while 39% were in the home on *some days* or *most days*. Few foods were in the home *every day* (5%). When examined by individual food (**Figure 1**), the presence of the snack foods in the home varied by food. The food most frequently reported in the home was goldfish crackers; 73% of parents said that goldfish crackers were in their home *some days*, *most days*, and *every day*. Vanilla wafers, butter crackers, and marshmallows were least likely to be found in the home; slightly over 70% of parents reported *never* or *rarely* having these foods in their home. About half of parents reported that cheese crackers, pretzel crackers, and chocolate were in the home on *most days* or *every day* in the home.

Frequency of different types of restrictive feeding practices

The first aim of this study was to describe parents' use of restrictive feeding practices as reported separately by both parents and children. Using frequency tables, parents' use of each restrictive feeding practice was first examined across all foods and then by individual foods.

Parent reports of restrictive feeding practices. To examine parental restriction of the eight study foods, parents were asked six questions from the Restricted Access Questionnaire. Parent responses from the Restricted Access Questionnaire were summed across all foods. Across the study foods, parents reported that they limit bringing 48% of the snack foods into the home. Of these foods, about half (54%) were limited because the parent did not want the child to consume them. In addition, 42% of the snack foods were kept out of the child's physical reach. When parents were asked if they required their child to ask permission to access each food, permission was required for almost all of the snack foods (88%). Yet, when asked if they typically responded *yes* or *no* to their child's requests, parents reported saying *yes* for over two-thirds of the snack foods. Over half (56%) of the study foods were allowed to be eaten during *snack*, while 42% were allowed during *dessert* or *special time*, and 2% during *anytime*. Parents reported that for 69% of the snack foods, they *always* or *usually* limited the quantity that children could consume and they *rarely* or *never* limited the quantity for 18% of the foods. Similarly, parents reported that they *rarely* or *never* allowed second helpings of 38% of the snack foods, *sometimes* for 38% of the snack foods, and *always* or *usually* for 24% of the snack foods.

Parents' use of restrictive feeding practices was also found to vary by the type of snack food. For example, 81% and 67% of parents intentionally limited bringing marshmallows and chocolate into the home, respectively; whereas, 29-50 % of parents did not limit how much of the remaining snack foods that they brought into the home (**Figure 2**). Approximately 70% of parents kept chocolate and marshmallows out of their child's reach compared to the 25-40% of parents that kept the other snack foods out of reach (**Figure 3**). When asked "*When do you allow your child to have these foods?*", 80% of parents reported that they allow their children to eat chocolate and marshmallows during *dessert* or *special occasions*, whereas 67-86% of parents

allowed access to cracker-like foods (i.e., graham crackers, cheese crackers, butter crackers, goldfish crackers, and pretzel crackers) during *snack* (**Figure 4**). Vanilla wafers were offered during *snack* and *special occasions* by 44% and 38% of parents, respectively. When asked whether their child needed permission to access each of the snack foods, almost all of the parents required permission: of these parents, 60% and 66% of parents typically said *no* after their child requested marshmallows or chocolate, respectively; in contrast, 11-31% of parents typically said *no* after their children requested the other snack foods (**Figure 5**). When asked if they limited how much of the snack foods their child can eat, 80% of parents reported that they *always* or *usually* limited how much chocolate, marshmallows, and vanilla wafers their child can eat while 60% *always* or *usually* limited how much of the remaining foods (**Figure 6**). And lastly, ~65% of parents said that they *never* or *rarely* allowed second helpings of chocolate and marshmallows (**Figure 6**) whereas 70-80% of parents *usually* or *sometimes* allowed second helpings (**Figure 7**) of the cracker-like foods (i.e., graham crackers, cheese crackers, butter crackers, goldfish crackers, and pretzel crackers).

Child perceptions of restrictive feeding practices. To examine child perceptions of parental restriction of the eight study foods, children were asked when they are allowed to eat the foods, who decides how much food they can have, and whether or not their parents would be upset if they ate the study foods without asking. Children reported that they were allowed to have 24% and 28% of the snack foods *anytime* or during *snack* time, respectively, while 31% of the foods were available during *special* or *dessert* times. Only 17% of the snack foods were *never* available. When asked if their parents or they themselves choose how much of the eight snack foods that they could eat, children reported that for 67% of the snack foods, parents choose how

much they could eat. Lastly, for 70% of the snack foods, children on average thought that their parents would be upset if they ate the foods without asking.

According to **Figure 8**, similarly to their parents, the children identified the study foods as belonging to one of two groups: *dessert* or *special time* and *snack* or *anytime* foods.

Approximately 70-80% of children identified chocolate and marshmallows as *dessert* or *special time* foods. Of the remaining six foods, 50-70% of children identified them as *snack* or *anytime* foods. The same separation of the study foods was seen again when children were asked whether or not they thought their parents would be upset if they ate the foods without asking. As shown in **Figure 9**, ~80% of parents would be upset if their child ate chocolate and marshmallows without asking. Approximately 60-65% of parents would be upset if their child ate the six other foods without asking.

Relation between parental reports of restriction and child perceptions of restriction

Exploratory factor analysis (EFA). The second aim of the study was to determine if parents' reports of restrictive feeding practices are related to children's reports of parental restriction. In preparation for this aim, an exploratory factor analysis (EFA) was conducted to identify the underlying factor structure of parent-reports on the Restricted Access Questionnaire. Specifically, questions related to aim 2 were entered into the EFA. The factor loadings and eigenvalues for each question are presented in **Table 7**. Each EFA continually revealed 2 factors with eigenvalues exceeding 1.0. Factor 1 is characterized by high loadings for graham crackers, vanilla wafers, cheese crackers, butter crackers, goldfish crackers, and pretzel crackers, and will be classified as crackers. Factor 2 is characterized by high loadings for chocolate and marshmallows, and will be referred to as candy. Across all questions, Factors 1 and 2 explain

>70% and ~ 20% of the variance, respectively. In addition, the reliabilities for each factor exceeded 90%, except for one.

Similarly, exploratory factor analysis was used to identify the underlying factor structure of kids' perceived restriction from a short restriction interview. The factor loadings and eigenvalues for both questions of the KCFQ (“*do your parents let you have these foods?*” and “*do your parents let you choose how much or do you tell them how much?*”) are presented in **Table 8**. For the first child measure, Factor 1 is characterized by high loadings for graham crackers, vanilla wafers, cheese crackers, butter crackers, goldfish crackers, and pretzel crackers and Factor 2 is characterized by high loadings in marshmallows. Except for chocolate not having high loadings for Factor 2, these factors were the same as the parent factors. For the second child measure, Factor 1 had high loadings for vanilla wafers, cheese crackers, butter crackers, and pretzel crackers and Factor 2 had high loadings for graham crackers, goldfish crackers, and marshmallows. For both child measures, Factors 1 and 2 explain about 50% and 15% of the variance, respectively. In addition, the reliabilities for Factor 1 and 2 are ~80% and ~40%, respectively.

Correlations between parent and child measures of restriction. The second aim of the study was to examine the relationship between parents' reports of restrictive feeding practices and children's reports of parental food restriction. Pearson correlations were used to investigate the hypothesis that parent reports of restriction predict child reports of parental restriction. First, the restriction subscales from the parent- and child-versions of the CFQ were correlated. Second, we correlated similar subscales from the parent's Restricted Access Questionnaire and the child's restriction interview, separately for crackers and candy; these subscales measured parents' use of two specific feeding strategies: when the child could eat the study foods and how much the child

could eat. No significant correlations were observed between the parent- and child-versions of the CFQ and KCFQ for crackers or candy (**Table 9**). However, parent and child reports of specific restrictive feeding strategies were moderately correlated for crackers. Parents who reported that they restrict when their children are allowed to access crackers tended to have children who reported similarly ($r=0.43$, $P=0.01$). In addition, children who reported that their parents typically chose how much of the crackers they could eat also tended to have parents who restricted second helpings of crackers ($r=0.37$, $P=0.03$) and restricted how much crackers the children were allowed to eat ($r=0.31$, $P=0.076$). No statistically significant correlations were observed for candy.

Discussion

The purpose of this paper was to describe different types of parental restrictive feeding practices as reported by parents and their preschool children and to determine whether parental reports of restriction predict child reports of parental restriction. In the current study, we found that almost all of the parents required their child to ask permission and limited how much of the eight study foods their children could have. Almost all of the children also reported that their parents would be upset if they didn't ask permission before eating the study snack foods and that their parents chose how much of these foods they could eat. Limiting second helpings of all eight study foods, intentionally limiting bringing the foods into the home, and keeping the foods out of their children's reach were restrictive strategies that were moderately practiced by the parents. Finally, both parents and children identified that children were allowed access to the eight study snack foods during specific, allotted times of the day, particularly during snack time. The individual restrictive strategies were also examined by their varied frequencies across the eight study foods. Out of the eight study foods, chocolate and marshmallows were the most restricted, while graham crackers and goldfish were two of the least restricted foods. The relationship between parent and child reports of parental use of restrictive feeding practices differed depending on the type of measure used. When parent- and child-versions of the Child Feeding Questionnaire were compared, no relationship between parent and child reports of restriction was observed. In contrast, statistically significant correlations were observed when parent and child reports of restrictive practices as it pertained to eight snack foods were compared. Specifically, parents who reported that they restricted when and how much of the eight snack foods their children ate had children who reported the same.

The snack foods were in the home at a moderate level. Less than half of the foods were reported to be in the home on most days; however, when examined by food, some foods were in the home more often than others. Goldfish crackers, a common preschool snack food, were in the home on most days for 73% of children. Slightly less common were cheese crackers, pretzel crackers, and chocolate. According to Ziegler, Briefel, Ponza, Novak, and Hendricks (2006), it is common for young children to consume these types of snack foods during morning and afternoon snacks at home and at daycare. In the last two decades, the average American child's intake of snack foods has increased, with the largest increases in consumption of salty snack foods and candies (Piernas & Popkin, 2010).

The first aim of the study was to describe parents' use of a variety of parental restrictive feeding practices, as reported by both parents and children, across eight study foods and by individual snack food. Across all study foods, most parents reported that they require their child to ask permission to access the snack foods, suggesting that parents are the gatekeepers in the home: they control their children's access to food. In addition, most children reported that their parents would be upset if they ate any of snacks foods without asking, suggesting that there were consequences for not asking permission and that children understood the consequences. Whether or not parents granted children access to the snack foods depended on the type of food. Around two-thirds of parents did not grant access to chocolate and marshmallows whereas over one-third of parents granted access to the cracker snack foods. This coincides with findings presented by O'Dea (1999), who found that according to children and adolescents, parents restrict children's access to candy more than they do for snacks like graham crackers. In addition, for half of the snack foods, parents intentionally limited bringing these foods into the home. This may be an effective and positive feeding strategy for limiting children's intake of palatable snack foods. For

example, limiting the availability of high energy dense snack foods has been shown to have a positive effect on child's eating habits. For example, Gonzalez, Jones, and Frongillo (2009) found that limiting the availability of snack foods in elementary schools increased 5th graders intake of fruits and vegetables.

Parents also reported keeping half of the study foods out of children's reach. However, similar to the previous strategies, 70% of parents kept candy out of reach while only 25-40% kept the crackers out of reach, suggesting that this strategy may be used with unhealthy foods more often. Keeping snack foods out of reach may represent a more negative controlling parenting strategy in which parents create a physical barrier between the child and the prohibited food (Karreman, van Tuijl, van Aken, & Dekovic, 2006). Having the food in the home but off-limits to children may increase children's attention toward the food and have the counterproductive effect of making it more desirable to the children.

Snack time emerged as a common time during which children were allowed access to the study snack foods. Parents reported that over half of the study snacks were available during snack and almost none during anytime (2%), while children reported a slightly less restrictive schedule in which over half of the snack foods were available during snack or anytime. However, when examined by foods, both parents and children reported that candy was available during dessert or special times; whereas, crackers were mostly available during snack time (or according to children both anytime and snack time). This is similar to an abstract presented by Savage and Rollins (2010) that showed that some parents tend to limit access to candy-like foods (e.g. skittles) to dessert or special occasions, but grant access to crackers and similar snack foods (e.g. popcorn, pretzels) during snack.

Limiting how much children could consume was commonly used as a restrictive feeding practice. Across the different types of study foods, parents typically limited the quantity of two-thirds of the snack foods based on both parent and child reports. However, whether parents restricted second helpings of the snack foods differed by the type of food. Almost two-thirds of parents rarely allowed second helpings of chocolate or marshmallows, whereas 70-80% of parents allowed second helpings of the crackers sometimes or most times. Perhaps for the latter question, parents may be less likely to limit second helpings of crackers because they are concerned that their child may still be hungry. Whereas the former question is more abstract, and may reflect parents' control of portion size and their initial intentions.

The second aim of the study was to determine if parents' reports of restrictive feeding practices were associated with children's reports of parental food restriction. We hypothesized that a moderate correlation would be observed between parent and child reports of restriction. There was, however, no correlation between the restriction subscales on the parent version of the CFQ and child version of the CFQ. Though both the CFQ and KCFQ have been used as measures of parental restriction in past studies, our findings suggest that they may be tapping into two different constructs. The restriction subscale on the CFQ consists of eight questions, five of which measure the degree to which parents limit the quantity of unhealthy foods that children consume (e.g. "*I have to be sure that my child does not eat too many sweets*", "*If I did not guide or regulate my child's eating, they would eat too many junk foods*"). Follow-up analysis revealed that parents' reports on the restriction subscale of the CFQ correlated with parents reports of limiting how much ($r=.37$, $p < 0.05$) and second helpings ($r=.42$, $p < 0.05$) of the cracker snack foods. In addition, two other questions on the restriction subscale assess parents' use of food as a reward: "*I offer sweets (candy, ice cream, cake, pastries) to my child as*

a reward for good behavior.” Perhaps, as illustrated in the latter question, many items on the restriction subscale assess not only parents’ use of restriction, but also parents’ motivation to restrict as well. The CFQ’s restriction subscale may assess parents’ motivations for and use of controlling feeding practices for the purposes of limiting children’s intake of unhealthy foods and eliciting good behaviors. In contrast, the restriction subscale on the KCFQ reports both restrictive feeding practices for parents in general and includes more of a variety of restrictive feeding strategies. For example, the subscale includes questions like *“If you ask for a snack, does your mommy let you have it?”* (permission and access), *“If you are with your mommy and you want something to eat, does she let you pick what you can eat?”* (food selection), and *“Does your mommy buy candy for you when you ask for it?”* (limit buying).

Though there was no correlation between the CFQ and the KCFQ, there were many other positive correlations between parent and child reports of restriction using the Restricted Access Questions and child restriction interview. Unlike the CFQ, the Restricted Access Questionnaire and the child restriction interview ask concrete, food-specific questions (e.g. *“How often is the [snack food] in your home?”*). This is in contrast to the broader and often more general CFQ questions (e.g. *“I have to be sure that my child does not eat too much of their favorite foods”, “If I did not guide or regulate my child’s eating, they would eat too many junk foods.”*) which are more abstract and vague. Perhaps children respond more accurately to direct, food-specific questions about restriction than general, non-specific food questions.

The relationships that were found between questions from the Restricted Access Questionnaire and the child restriction interview measured similar constructs: i.e. limiting quantity and when children could access snack foods. Parents who limited when their children could access the cracker snack foods (e.g. snack foods, anytime) had children who reported

similarly. In addition, children who were more likely to report that their parents choose the amount of cracker snack foods that they could eat tended to have parents who reported that they limited the quantity and the second helpings of these foods. These findings are similar to Fisher and Birch (1999), who used the Restricted Access Questionnaire and restriction interview questions (as in this study) to demonstrate that mothers' and daughters' reports of restriction were related. However, we extended this finding by describing and correlating each type of restrictive feeding practice across parent and child reports.

This study has several strengths. The study included four validated measures of parental restriction, two that were reported by children. In addition, during the restriction interview, children were able to taste the eight study foods before reporting perceived parental use of restriction. This is one of the few studies to date to examine parents' use of restrictive feeding by the type of strategy used and food type, and to compare child and parent reports of restriction. If restriction had been summed across all questions of the parent and child versions of the Restricted Access Questionnaire, as it has been done in all previous studies (Fisher and Birch, 1999), the difference in proportion of parents practicing the various feeding strategies would have been missed. This difference in frequency of use of restrictive feeding strategies can provide important insight into restriction and for making recommendations for effective parenting styles. Some weaknesses in the study were also observed. This study, like most in the restriction literature, consists of a cross-sectional design with a small, homogenous sample (98% white, highly educated parent, upper-middle class, central PA). Therefore, the results of this study cannot be generalized to various races, ethnicities, or socioeconomic statuses. In addition, due to the small sample size, we were not able to examine differences in parents' use of restrictive feeding practices by gender as it was done in Fisher and Birch (1999).

In summary, parents frequently employed the restrictive feeding practice of requiring their child to ask permission, limiting how much their child could have, and moderately employed the restrictive feeding practices of limiting second helpings, limiting bringing into the home, and keeping the palatable foods out of physical reach of their child. Parents also allotted certain periods of the day to allow their children access to the foods. The two food groups, candy and crackers, were continuously seen to elicit different degrees of the restrictive strategies, with the candy foods being subjected to more restriction. Although there was no overall correlation between parent and child reports of restriction using the CFQ and KCFQ, respectively, there were positive correlations between parent and child reports of restriction using the Restricted Access Questions and child restriction interview when the questions measured similar constructs (i.e. limiting quantity and when child could access snack foods).

Based on these findings, it is evident that there is a need to discriminate between different feeding styles and between parent and child reports of restriction. By looking at individual restrictive feeding strategies, we were able to provide a clearer look at the type of restriction parents are practicing than what would have been possible via a global measure of restriction. In addition, by comparing parent and child measures of restriction, we were able to determine the differences between the measures and notice that what parents are doing and what children perceive parents are doing is similar. Examining restriction via its feeding styles and through the eyes of children can provide a more complete and informative view of restriction. Investigating restriction in a diverse, representative population using longitudinal studies and parent and child versions of the Child Feeding Questionnaire and the Restricted Access Questionnaire for both global measures and individual restrictive feeding strategies can provide important insight into restriction and making recommendations for effective parenting styles.

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Tables

Table 1

The eight snack foods given to children in the study

Snack foods	Food brand and manufacturer
Graham crackers	Scooby Doo Cinnamon Baked Graham Crackers (Keebler), SpongeBob Honey Maid Graham Crackers (Nabisco), Cinnamon Graham Goldfish Crackers (Pepperidge Farm)
Vanilla wafers	Mini Nilla Wafers (Nabisco)
Cheese crackers	Cheez-It Baked Crackers (Sunshine), Flipsides Cheddar Pretzel Crackers (Townhouse), Cheez-It Baked Crackers (Sunshine)
Butter crackers	Club Snack Sticks Crackers (Keebler)
Goldfish crackers	Cheddar Goldfish Crackers (Pepperidge Farm)
Pretzel crackers	Munchables Pretzel Thins Crackers (Ritz)
Chocolate	Chocolate Kisses (Hershey)
Marshmallows	Jet-Puffed Marshmallows (Kraft)

Table 2

Parent and child characteristics (N= 30)

	Mean	SD	Range
Parent Characteristics			
Mom BMI	23.2	4.4	17.0 - 35.5
Dad BMI	27.0	4.7	18.6 - 40.2
Child Characteristics			
Age (years)	4.6	0.7	3.3 - 5.8
Weight-for-Age Percentiles	54.1	24.3	9.4 - 95.8
BMI	15.5	1.6	8.3 - 18.4
Race (%)			
American Indian/Alaskan Native	3.1		
Asian	15.6		
Black or African American	3.1		
White	78.1		
Sex (%)			
Male	41.8		
Female	58.8		

Ethnicity (%)

Hispanic or Latino	8.8
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Not Hispanic or Latino	91.8
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Weight Status (%)

Overweight	14.7
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Not Overweight	85.3
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Table 3

Restriction subscale of the parent version of the Child Feeding Questionnaire (CFQ)

<i>Question</i>	Mean	SD	Range
<i>I have to be sure that my child does not eat too many sweets (candy, ice cream, cake or pastries).</i>	4.3	0.9	1-5
<i>I have to be sure that my child does not eat too many high fat foods.</i>	3.6	1.3	1-5
<i>I have to be sure that my child does not eat too much of their favorite foods.</i>	3.0	1.1	1-5
<i>I intentionally keep some foods out of my child's reach.</i>	4.4	0.7	1-5
<i>I offer sweets (candy, ice cream, cake, pastries) to my child as a reward for good behavior.</i>	2.3	1.1	1-5
<i>I offer my child their favorite foods in exchange for good behavior.</i>	2.4	1.2	1-5
<i>If I did not guide or regulate my child's eating, they would eat too many junk foods.</i>	3.6	1.1	1-5
<i>If I did not guide or regulate my child's eating, they would eat too many of their favorite foods.</i>	3.3	1.2	1-5
CFQ restriction subscale	3.4	0.7	

Note. Response options were “disagree” = 1, “slightly disagree” = 2, “neutral” = 3, “slightly agree” = 4, “agree” = 5

Table 4

Parent version of the Restricted Access Questionnaire

<i>Questions</i>	Mean	SD	Range
<i>How often is the food in your home?¹</i>	3.5	0.7	1-5
<i>Do you intentionally limit how much you bring the food into your home?²</i>	1.9	0.7	1-3
<i>At home, do you try to keep the food out of your child's reach?³</i>	1.4	0.4	1-2
<i>At home, does your child need permission to eat the food?⁴</i>	2.2	0.5	1-3
<i>At home, do you generally limit how much of the food your child is allowed to have?⁵</i>	3.8	1.0	1-5
<i>When do you allow your child to have these foods?⁶</i>	2.6	0.6	1-5
<i>Is your child allowed to have second helpings of the food?⁷</i>	3.2	0.7	1-5

Note. ¹ Response options were “everyday” = 1, “most days” = 2, “some days” = 3, “rarely” = 4, “never” = 5

² Response options were “no” = 1, “yes for other reasons” = 2, “yes because I do not want my child to eat” = 3

³ Response options were “no” = 0, “yes” = 1

⁴ Response options were “no” = 1, “yes- I saw YES more often than not” = 2, “yes- I saw NO

more often than not = 3

⁵ Response options were “*never*” = 1, “*rarely*” = 2, “*sometimes*” = 3, “*usually*” = 4, “*always*” = 5

⁶ Response options were “*anytime*” = 1, “*snack*” = 2, “*dessert*” = 3, “*special occasions*” = 4, “*don’t allow*” = 5

⁷ Response options were “*always*” = 1, “*usually*” = 2, “*sometimes*” = 3, “*rarely*” = 4, “*never*” = 5

Table 5

Restriction subscale of kid version of the Child Feeding Questionnaire (KCFQ)

<i>Questions</i>	Mean	SD	Range
<i>Does your mommy buy candy for you when you ask for it?</i>	1.8	0.9	1-3
<i>If you ask for a snack, does your mommy let you have it?</i>	1.3	0.5	1-3
<i>If you are with your mommy and you want something to eat, does she let you pick what you can eat?</i>	1.5	0.8	1-3
<i>If you are with your mommy and you want something to eat, does she let you pick how much you can eat?</i>	1.9	1.0	1-3
<i>Can you have candy when you want it?</i>	2.0	1.0	1-3
<i>Are you allowed to get your own snacks?</i>	1.9	0.9	1-3
<i>Does your daddy buy candy for you when you ask for it?</i>	2.1	1.0	1-3
<i>If you ask for a snack, does your daddy let you have it?</i>	1.5	0.8	1-3
<i>If you are with your daddy and you want something to eat, does he let you pick what you can eat?</i>	1.4	0.7	1-3

If you are with your daddy and you want something to eat, does he let you pick how much you can eat?

1.8

0.9

1-3

KCFQ restriction subscale

1.8

0.5

Note. Response options were “yes” = 1, “sometimes” = 2, “no” = 3.

Table 6

Child restriction survey

<i>Questions</i>	Mean	SD	Range
<i>Does your mom/dad let you have the food?¹ (allow)</i>	1.7	0.9	0-4
<i>Would your parents be upset if you ate the food without asking?²</i>	0.7	0.3	0-1
<i>Does your mom/dad let you choose how much of the following food you can eat, or do they choose?³</i>	0.7	0.3	0-1

Note. ¹ Response options were “no” = 4, “special time” = 3, “dessert” = 2, “snack” = 1, “anytime” = 0

² Response options were “yes” = 1, “no” = 0

³ Response options were “parent chooses” = 1, “both” = 0.5, “child chooses” = 0

Table 7

Exploratory Factor Analysis of three parental restriction measures

	Do you generally limit how much the child is allowed to have?		Is your child allowed to have 2 nd helpings?		When do you allow your child to have?	
	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
	Crackers	Candy	Crackers	Candy	Crackers	Candy
Graham crackers	.95	.1	.99	-.06	.96	.24
Vanilla wafers	.94	-.18	.99	-.06	.93	.24
Cheese crackers	.99	.11	.99	-.06	.96	.24
Butter crackers	.99	.11	.99	-.06	.96	.24
Goldfish	.99	.11	.90	-.37	.98	.08
Pretzels	.98	-.16	.99	-.06	.83	-.01
Chocolate	.02	.99	-.25	.94	.10	.91
Marshmallows	.02	.99	.06	.97	.19	.89
Variance:	.71	.26	.75	.22	.72	.18
Alpha:	.97	.98	.98	.96	.97	.88
Eigenvalue:	3.6	2.1	6.0	1.8	5.7	1.5

Table 8

Exploratory Factor Analysis of two parental restriction measures as perceived by children

	Does your mom/dad let you have?		Does your mom/dad let you choose how much or do they tell you how much?	
	Factor 1	Factor 2	Factor 1	Factor 2
	Crackers	Candy	Crackers	Candy
Graham crackers	.91	.17	.31	.73
Vanilla Wafer	.90	.19	.73	.02
Cheese crackers	.82	.14	.80	-.04
Butter crackers	.84	-.10	.74	.28
Goldfish	.95	-.48	.12	.67
Pretzels	.30	-.41	.85	.20
Chocolate	-.48	-.72	.37	.50
Marshmallows	.65	.83	-.12	.76
Variance:	.61	.16	.43	.16
Alpha:	.83	.42	.81	.35
Eigenvalue:	5.5	1.5	4.0	1.3

Table 9

Correlations between various parent and child measures of restriction of the cracker snack foods

(N = 29)

	Allow ³	Choose how much ³	Child Report of Restriction ⁴
Limit how much ¹	-0.02	0.31 †	0.01
When do you allow ¹	0.43 *	0.19	0.14
Allowed Second Portions ¹	0.16	0.37 *	0.10
Parent Report of Restriction ²	0.40 *	0.12	-0.05

Note. *P<.05, †P<.10,

¹Questions from the parent version of the Restricted Access Questionnaire: “limit how much” = “At home, do you generally **limit how much** of the food your child is allowed to have?”, “when do you allow” = “**When do you allow** your child to have these foods?”, “allowed second portions” = “Is your child allowed to have **second helpings** of the food?”

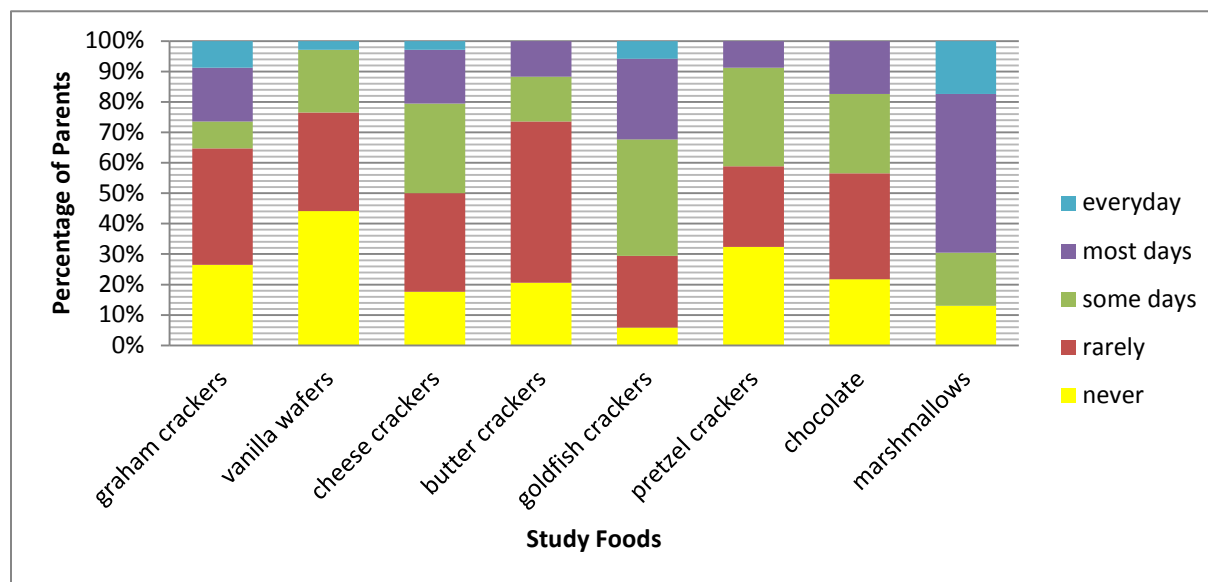
²Restriction subscale from the parent version of the Child Feeding Questionnaire.

³Questions from the child survey (similar to the Restricted Access Questionnaire): “allow” = “Does your mom/dad let you have the food?”, “choose how much” = “Does your mom/dad let you **choose how much** food you can eat or do they tell you how much?”

⁴ Restriction subscale from the kid version of the Child Feeding Questionnaire

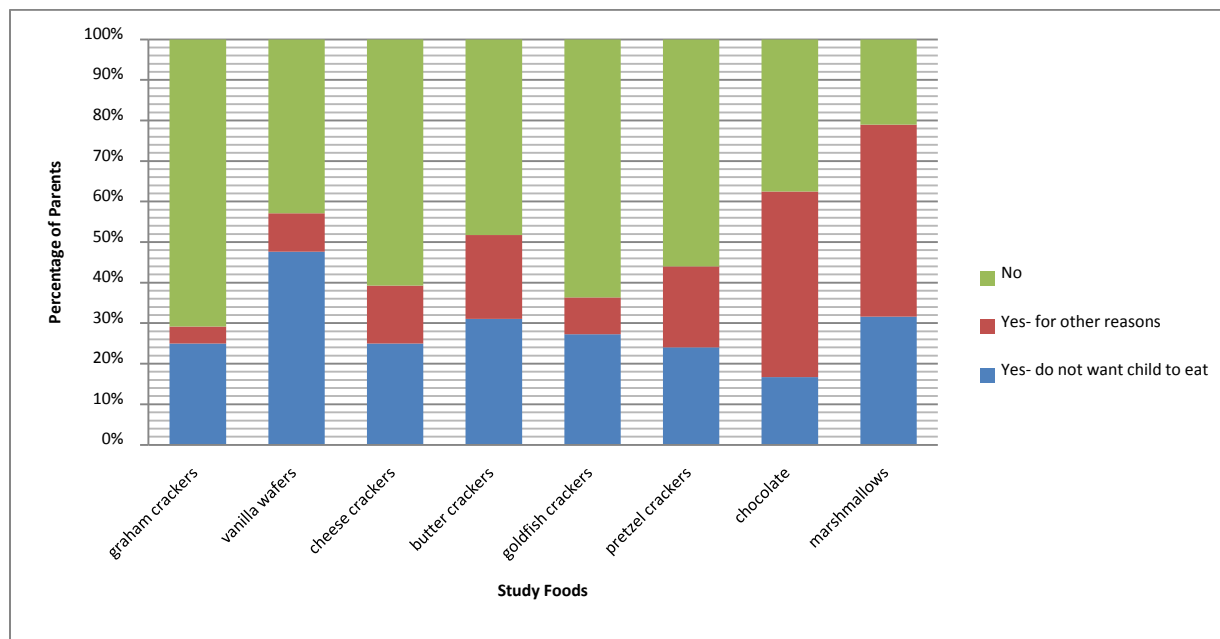
Figures

Figure 1: Presence of the eight study foods in the home¹



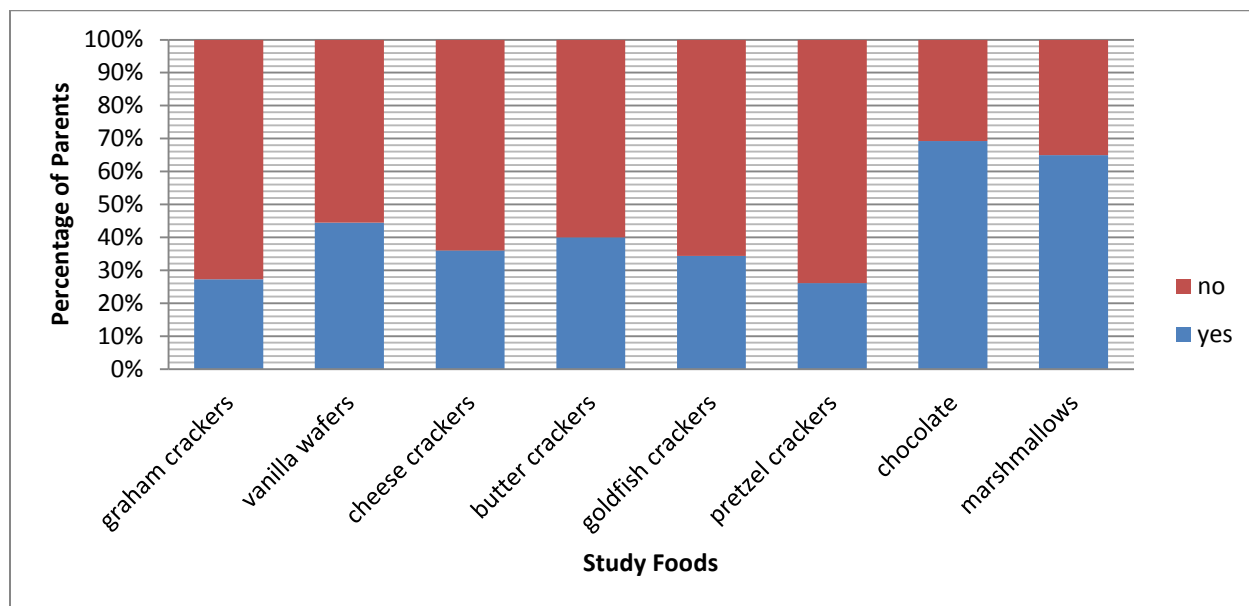
¹ Parents' responses to "How often are the following foods in your home?" from the Restricted Access Questionnaire.

Figure 2: Percentage of parents who do or do not intentionally limit how much the study foods are in their home¹



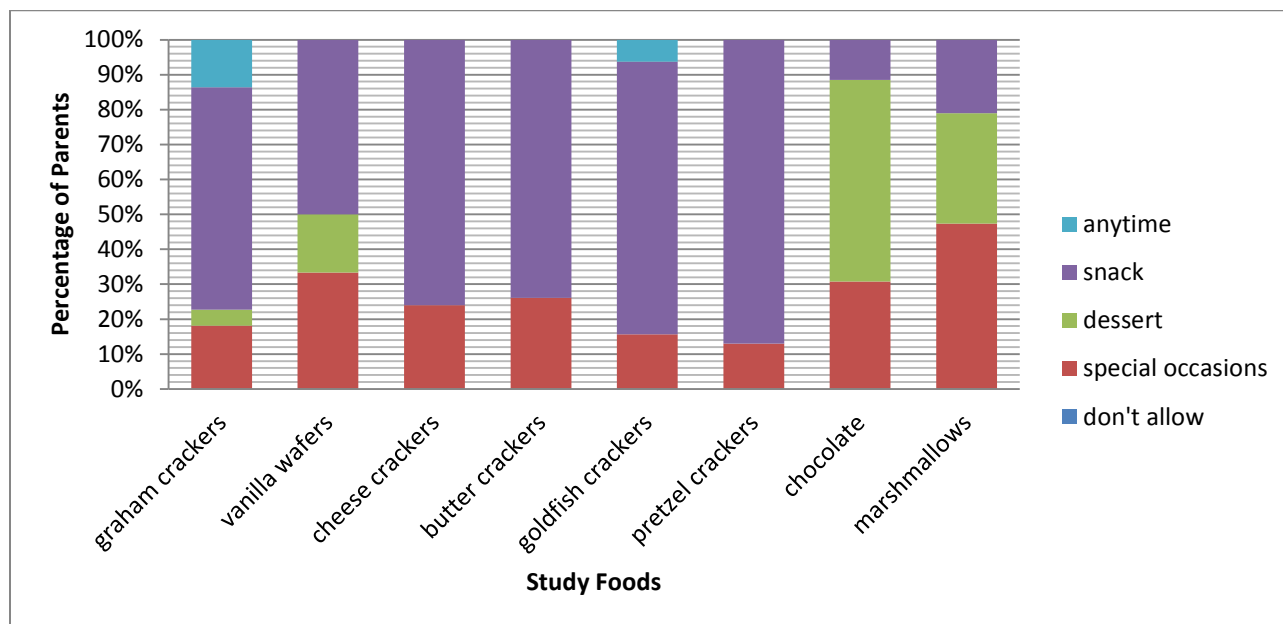
¹Parents' responses to "Do you intentionally limit how much you bring the following foods into your home?" from the Restricted Access Questionnaire.

Figure 3: Percentage of parents who do or do not keep the study foods out of their child's reach¹



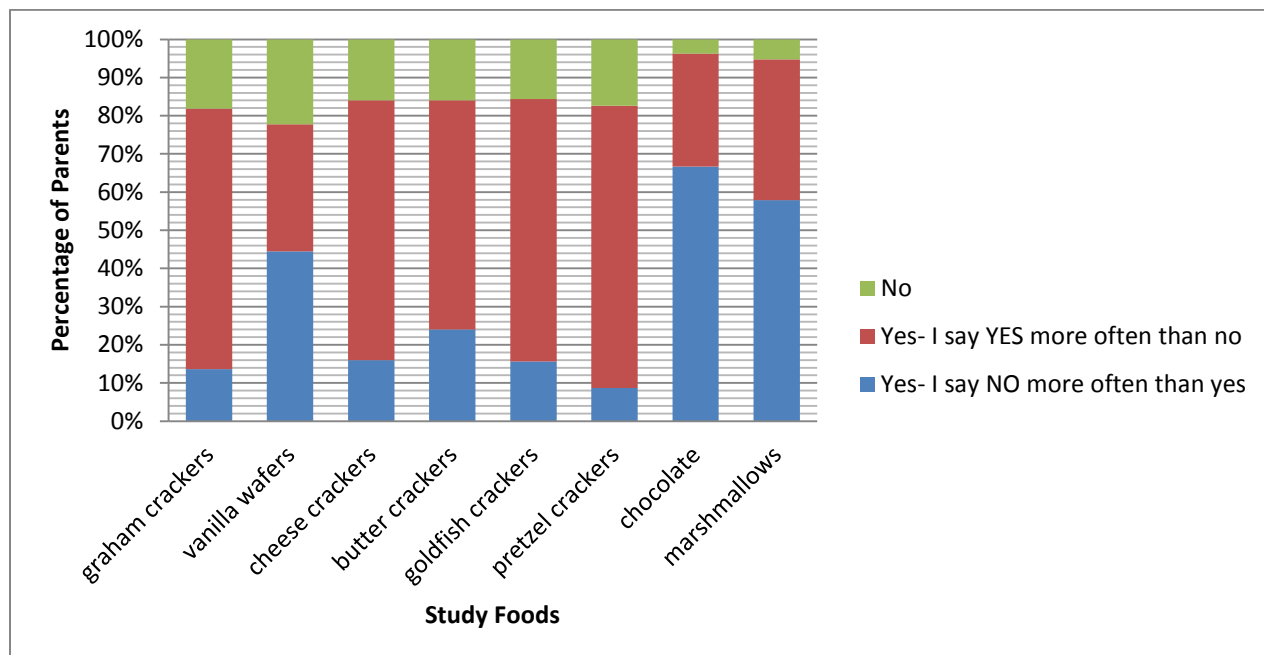
¹ Parents' responses to "At home, do you try to keep the following foods out of your child's reach?" from the Restricted Access Questionnaire.

Figure 4: When parents allow their children to eat the study foods¹



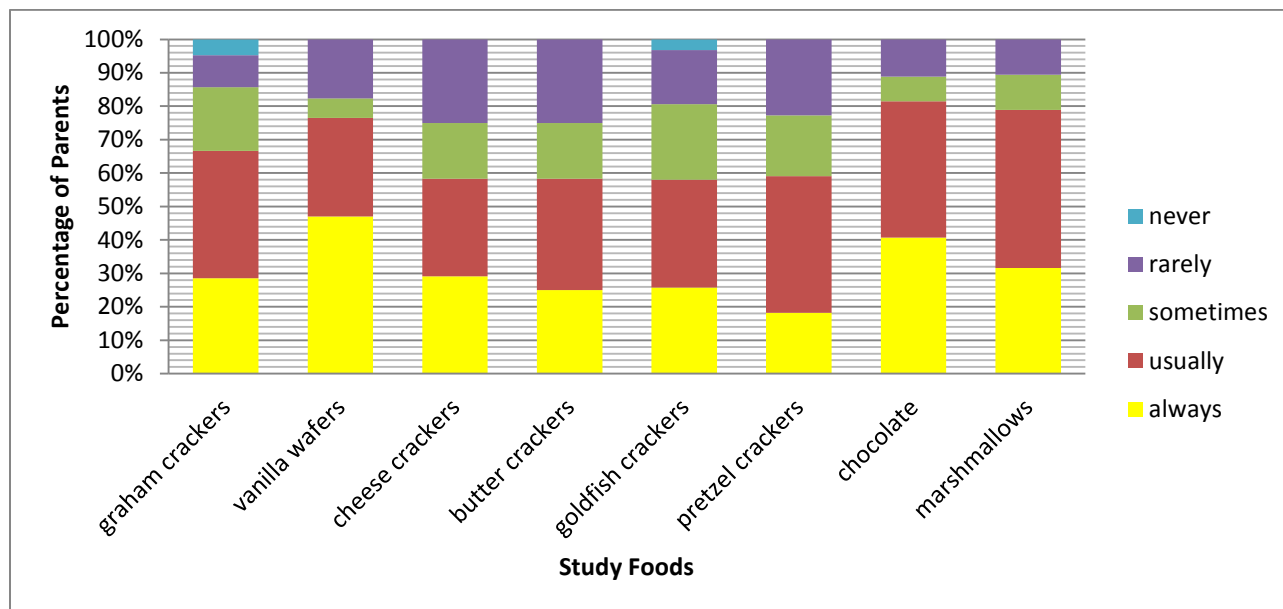
¹ Parents' responses to "When do you allow your child to have the following food?" from the Restricted Access Questionnaire.

Figure 5: Percentage of parents who do or do not require their child to ask permission before eating the study foods¹



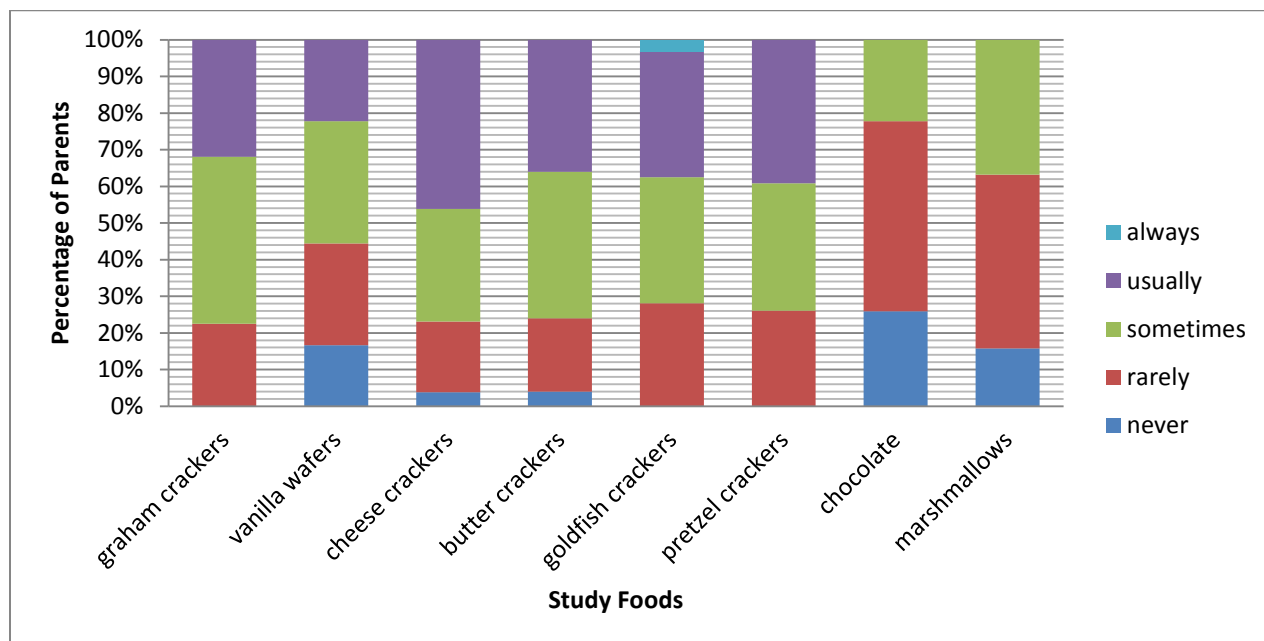
¹ Parents' responses to "At home, does your child need permission to eat the following foods?" from the Restricted Access Questionnaire.

Figure 6: Percentage of parents who do or do not intentionally limit how much of the study foods their child is allowed to have¹



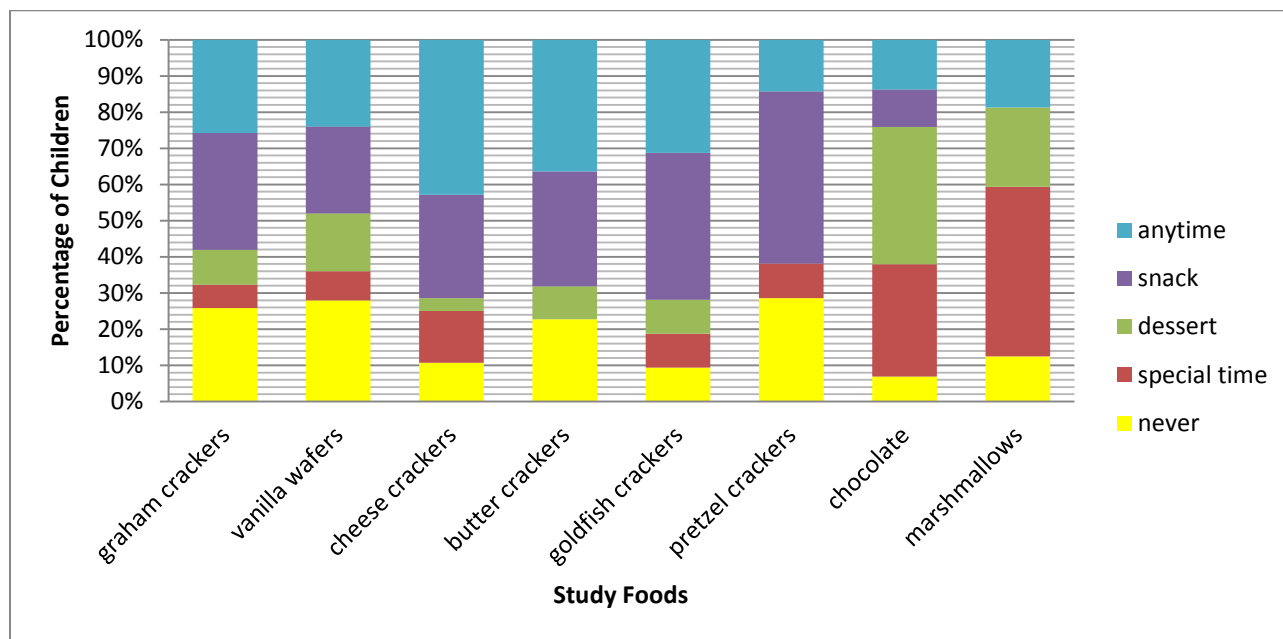
¹ Parents' responses to "At home, do you generally limit how much of the following food your child is allowed to have?" from the Restricted Access Questionnaire.

Figure 7: How often parents allow their children to have second helpings of the study foods¹



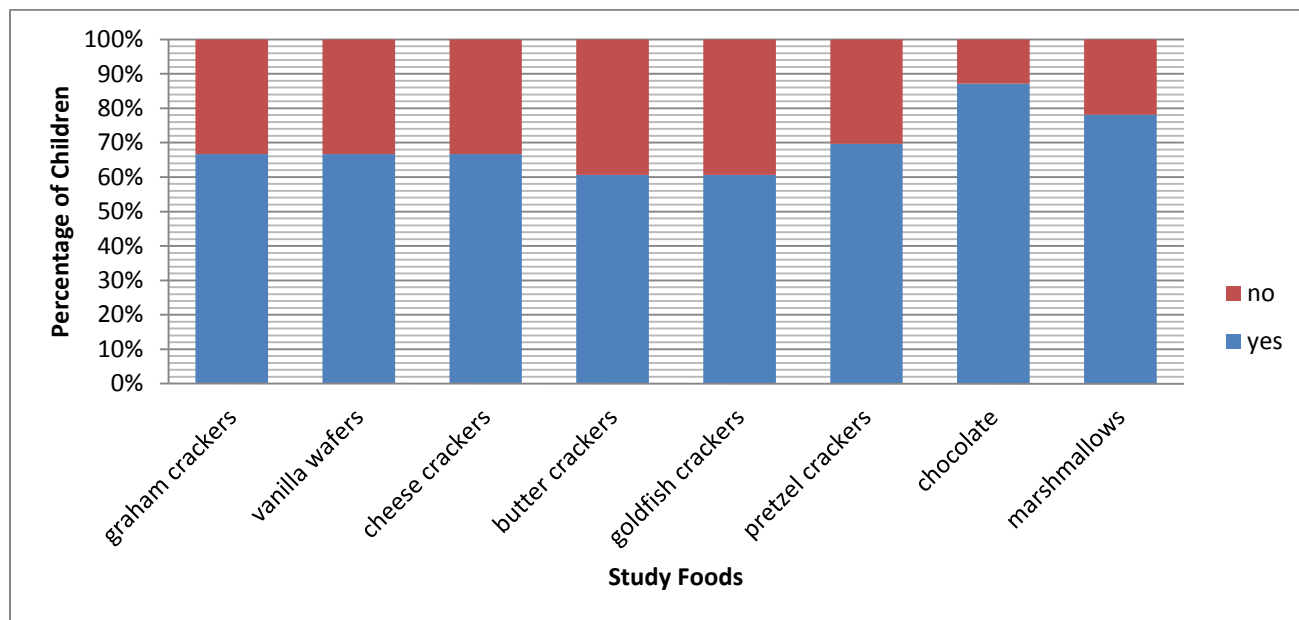
¹ Parents' responses to "Is your child allowed to have second helpings of the food?" from the Restricted Access Questionnaire.

Figure 8: When children perceive their parents allow them to have the study foods¹



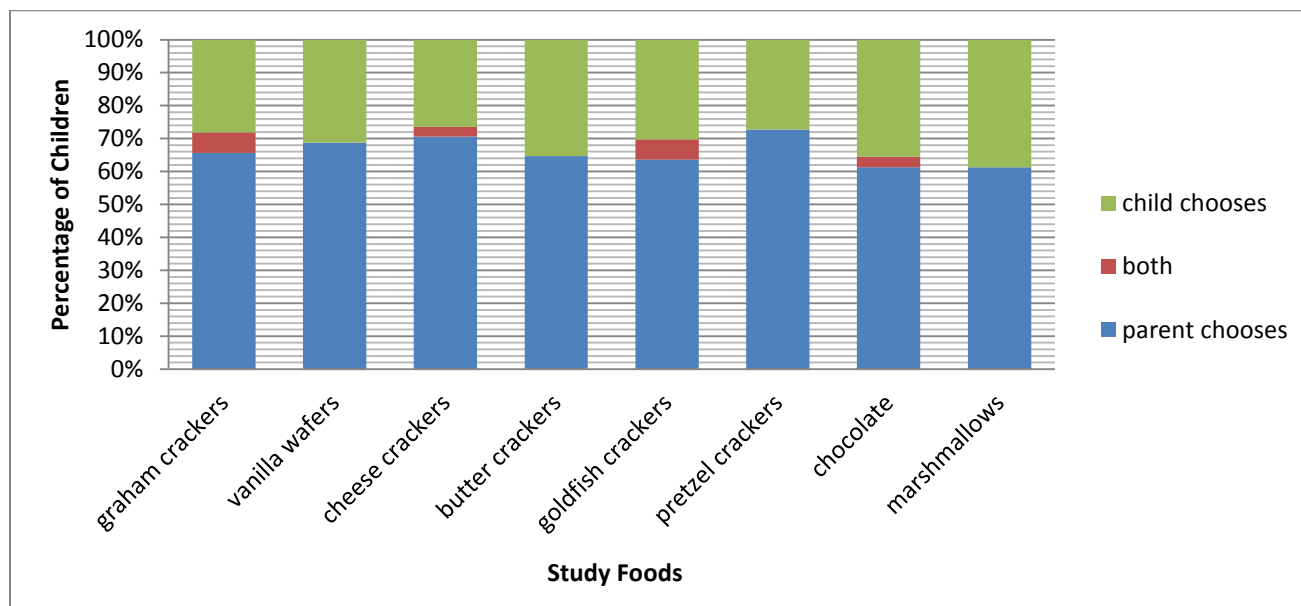
¹ Children's responses to "When does your mommy/daddy allow you to have the following food?" from the child's survey similar to the Restricted Access Questionnaire.

Figure 9: Percentage of children who believe their parents would or would not be upset if they ate the study foods without asking¹



¹ Children's responses to "Would your mommy/daddy be upset if you ate the following food without asking?" from the child's restriction interview.

Figure 10: Children’s reports of who decides how much they can eat¹



¹ Children’s responses to “Does your mommy/daddy let you choose how much of the following food you can eat, or do they tell you how much you can eat?” from the child’s restriction interview.

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EDUCATION

The Pennsylvania State University
Schreyer Honors College
B.S. in Nutritional Sciences
Minors in Latin and Biology

University Park, PA
Expected: May 2012

RESEARCH

Research Laboratory Intern at The Commonwealth Medical College

- Investigated the role of butyrate, a by-product of dietary fiber, plays in colon cancer
- Assisted in performing various molecular biology techniques, such as cell culture, protein assays, and luciferase assays

May-August 2011
Scranton, PA

Research Assistant at The Center for Childhood Obesity Research

- Investigated the effects of food restriction on children's behavior and weight status
- Executed procedures on children aged 3-5 years
- Performed data collection, coding, entry, and analysis

Aug. 2011-Present
University Park, PA

MEDICAL EXPERIENCE

Global Medical Brigades

- Established mobile medical and dental clinics in the poorest and most rural regions of the country where health services are nonexistent
- Assisted doctors and dentists in treating over 1,500 men, women, and children
- Worked in the pharmacy and provided prescription drugs to patients
- Recruited Health Professionals and collected donations as a member of the Medical Supplies Committee
- Volunteered with 30 orphans and lived on-site at orphanage

Jan. 2010
Honduras, Central America

LEADERSHIP

Relay for Life Chair

- Organized fundraisers and solicited businesses for the American Cancer Society
- Led the third highest fundraising team in State College
- Responsible for a committee of 60 members

Aug. 2010- May 2011
University Park, PA

Resident Assistant

- Supervised 55 undergraduate students in Schreyer Honors College Special Living Option
- Fostered a positive living community within a diverse group of students
- Planned and executed programs in order to enhance the experiences of students
- Nominated to The National Residence Hall Honorary by Coordinator

June 2010- Present
University Park, PA

Teaching Assistant

- Led exam review sessions for over 40 students for 100-level and 200-level nutrition courses
- Graded various assignments and proctored exams for more than 100 students

Aug. 2011- Present

Schreyer Honors College Day Of Service Chair

- Service Site Coordinator Chairperson for three years (2009-present)
- Found organizations to participate and match 80+ volunteers with activities/locations
- Taught Site Leaders about service learning
- Site Leader for first-ever Honors College Day of Service (2009)
- Led 20 students in an Adopt-A-Highway volunteer activity
- Solicited businesses for food and beverage donation

March 2009-Present
University Park, PA

EMPLOYMENT

Promotional Specialist at Capital Wine and Spirits

- Provide one-on-one tastings of various beverages at on-site locations
- Second highest drink seller for the company in January 2012

October 2011-Present
University Park, PA

AWARDS

Student Leader Scholarship
Schreyer Academic Scholarship Recipient
Rising Star Award for Active Involvement in the Residence Halls

2010-2011
2008 - Present
2009