INFORMATION PROVISION, INFORMATIONAL VALUE, AND RELATIONAL SUPPORT: ASSESSING PERCEPTIONS OF PEDIATRIC FAMILY-CENTERED COMMUNICATION AS PREDICTORS OF WEIGHT-RELATED OUTCOMES IN PRESCHOOL CHILDREN

BY

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DISSERTATION

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Abstract

The Centers for Disease Control and Prevention currently estimate that one of every eight preschool age children in the U.S. are overweight or obese, and those preschoolers are five times more likely to become overweight adults compared with those in a healthy weight range (CDC, Vital Signs, 2013; Ogden, Carrol, Kit, & Flegal, 2014). Pediatric well-child visits are arguably one of the most opportune times to address weight-related problems and obesogenic behavioral patterns at both the family and individual levels (Tyler & Horner, 2008). Parents of 24-48 month olds completed two surveys one year apart, (n=291 in the longitudinal sample). Children were weighed and measured at both time points. Survey measures assessed parental perceptions of communication with their regular pediatric health care providers, including the provision of recommendations for weight-related behaviors, the value associated with that advice in terms of influence on behavior and decision-making, and satisfaction with the quality and quantity of the information provided. Using questions adapted from the Primary Care Assessment Survey (PCAS) and the Health Care Climate Questionnaire (HCCQ) parents reported how much relational support they received from their providers, including assessments of provider-parent communication, interpersonal treatment, trust, satisfaction with care, autonomy support, knowledge of the patient/family, and overall satisfaction with care. Parents also reported child food consumption (both obesogenic and anti-obesogenic foods), daily minutes of physical activity, and daily minutes of TV viewing. Hierarchical multivariate regression analyses indicated that the provision of weight-related recommendations specific to a type of weight-related behavior did not significantly predict the enactment of those behaviors one year later, in the presence of other informational and relational variables. Parental perception that their health care provider discussed the risks and consequences of being overweight predicted decreased obesogenic food consumption, but increased TV viewing behavior. Parental satisfaction with the quality of information provided predicted an increase in child physical activity. Satisfaction with information quantity, however, predicted decreased amounts of activity. The influence provider advice had on parental decisions about child behavior predicted decreased amounts of TV viewing and decreased child BMI percentile. Contrary to the hypothesis, better parent assessments of the
provider-parent relationship at Time 1 predicted increased consumption of obesogenic foods and Child BMI percentile one year later. None of these factors predicted child changes in the consumption of fruits and vegetables. Overall, the results of this study present the possibility that focusing too much on simply providing information to families, or on developing/maintaining provider-parent relationships, may not result in positive weight-related outcomes for child patients, and may under some circumstances have a negative impact on changes in child weight and weight-related behaviors. Additional research should be undertaken to determine how parents judge informational value and influence, and how pediatric health care providers can tailor their communication strategies to increase the perceived value of their messages.
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Introduction

Over the past thirty years, obesity rates have risen dramatically in the United States, and have more than doubled in just the past two decades (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). Current estimates show that two-thirds of adults are either overweight or obese according to CDC benchmarks (Fryar, Carroll, & Ogden, 2012). In addition, approximately a third of all American children aged 2 to 19—or roughly 23 million children—are overweight or obese, including one out of every eight children of preschool age (CDC, Vital Signs, 2013; Levi et al., 2013; Ogden, Carrol, Kit, & Flegal, 2014).

Childhood obesity is more prevalent among many clinically-underserved (non-white) populations, with approximately 35.2% of non-Hispanic black and 38.9% of Hispanic children (age 2 to 19) considered overweight or obese, compared with only 28.5% of white children (Ogden et al., 2014). This includes 11.3% of black preschoolers and 16.7% Hispanic preschoolers who are considered clinically obese, compared with only 3.5% of non-Hispanic white preschoolers. Children from families with incomes below the federal poverty limit are also almost twice as likely to be obese as children from families at 500% of the poverty line or above (HHS, Leading Health Indicators, 2013).

As with overweight/obesity (OW/OB) in the adult population, the consequences of childhood OW/OB are more than just social or cosmetic. Although some of these serious health complications occur later in life (e.g., heart disease, high cholesterol, certain types of cancer), others can affect people during their childhood and teenage years (e.g., asthma, sleep apnea, acid reflux high blood pressure, joint pain) (CDC, Overweight and Obesity, 2012). Type 2 diabetes, once considered an adult disease, is now more common among children and teenagers, with significantly higher incidence rates in black, Hispanic, Asian/Pacific Islander, and Native American adolescent populations (CDC, 2011 National Diabetes Fact Sheet, 2011; Levi et al., 2013).

Although there are indications that rates of childhood obesity have either leveled off or declined in many areas of the country over the last decade, particularly with preschool-aged children, there are still many racial/ethnic, economic, and geographic disparities that need to be addressed (CDC, Vital Signs, 2013; Ogden, et al., 2014). The Institute of Medicine (IOM) has called for a new “sense of urgency”
focused on prevention efforts specifically in young children (IOM Committee on Obesity Prevention Policies for Young Children, 2011). They argued that

“…young children’s early experiences are “built into their bodies,” affecting neural, metabolic, and behavioral systems in ways that can influence the risk for obesity, health, and well-being throughout the life span (Birch & Anzman, 2010; Gluckman et al., 2008; NRC & IOM, 2000). Evidence now emerging reveals the potential of this early period for obesity prevention. In contrast to later stages of life, early development is a period when it is not necessary to change established dietary and activity patterns, but to promote the development of healthy patterns. Despite the critical role of early learning and development in shaping obesity risk, infancy and early childhood have not been a focus of obesity prevention efforts. Yet precisely because this early period is one of rapid development, it may afford the best opportunities for altering development in ways that can reduce obesity risk” (p. 20).

Research findings have also underscored the importance of addressing weight-related problems early in children’s development, before obesogenic behavioral patterns become more ingrained and difficult to change (Birch & Ventura, 2009). There is much evidence detailing the trajectory of BMI from infant and preschool age to school age and adulthood. For instance, a longitudinal study by Taveras et al. (2009) reported that increases in weight-for-length ratio in children younger than 6 months of age were associated with an increased probability of being obese at age three. Nader et al. (2006) discovered that children who were overweight or obese (BMI ≥ 85th percentile) at 24, 36, or 54 months were five times more likely than their healthy-weight peers to be overweight at age 12. Interestingly, none of the children in this study who were below the 50th percentile at age three were overweight at age 12. Skinner, Bounds, Carruth, Morris, and Ziegler (2004) also found that adiposity at age 2 predicted adiposity at age 8. Ultimately, the CDC (2013) reports that children who are OW/OB as preschoolorers are five times more likely to be OW/OB as adults, compared with preschoolers in a healthy weight range.
Childhood overweight/obesity presents a difficult public health challenge because it is a complex problem stemming from a multitude of sources at multiple levels. Media coverage of the childhood obesity epidemic has placed blame on poor diet, lack of exercise (at home and school), lack of access to nutritious food/drink (in the home, school, and neighborhood environments), the promotion of unhealthy foods/beverages in the media, parental behaviors, and the higher cost of healthy food (Hawkins & Linvill, 2010). There are also multiple levels of influence—individual, familial, community (schools, community organizations, physical environment), governmental (local, state, and federal policy), and societal (industry, media, social programs). These factors are visually represented in the Six-C’s model (Harrison et al., 2011, see Figure 1), which depicts them as spheres of influence (cell, child, clan, community, country, and culture)—creating a cell-to-society ecological model of factors influencing energy balance and weight. What makes the Six-C’s conceptualization of the problem different from many other multi-level ecological models is that it includes health care providers as influential actors within the system.

**Why Focus on Health Care Providers?**

Health care providers are in a unique position to deal with OW/OB because they can treat the issue as a health problem, rather than a socio-cultural preference based on perceptions of normalcy or attractiveness (Barlow, Bobra, Elliott, Brownson, & Haire-Joshu, 2007). Specifically, well-child visits provide an opportunity for pediatric practitioners to discuss the topic and diagnose weight-related issues because they are already a collection point for height and weight data (necessary to calculate body mass index, or BMI), and are generally longer than acute care appointments. Extended time allotments offer a greater opportunity for providers to give guidance, allow parents to ask more questions, and permit the discussion of non-acute health issues, family health history, and treatment options (Benson, Baer, & Kaelber, 2009; Halfon, Stevens, Larson, & Olson, 2011; Miller & Silverstein, 2007). As a result, parents are significantly more satisfied with longer well-child visits (over ten minutes in length) than shorter appointments (Halfon et al., 2011).

Research indicates that approximately two-thirds of parents believe a physician’s office is the best place to address and manage their child’s weight issues—primarily because they trust the
pediatrician’s expertise, and believe that overweight/obesity has strong implications for children’s future health (Eneli et al., 2007). The majority of parents also believe pediatricians are a more valuable information source about child weight issues than are family members or friends (Hernandez, Cheng, & Serwint, 2010). This is especially true for parents who are themselves overweight (Eneli et al., 2007).

In general, parents say they value and are motivated by messages from their pediatric health care provider when considering weight-related behavior change in their families, and feel it is important for their child’s provider to give them information regarding weight, nutrition and diet, activity, and other obesogenic behaviors like TV viewing (Kubik, Story, Davey, Dudovitz, & Zuehlke, 2008). Of course, what information parents say motivates them and what messages actually motivate them may be quite different. Behavior change involves more than simply giving and receiving information. It also involves getting the right information to the right receiver, framed and delivered in the right way, within a context that allows the receiver to use it effectively.

Many researchers and practitioners (e.g., IOM Committee on Obesity Prevention Policies for Young Children, 2011; Miller & Silverman, 2007; Tyler & Horner, 2008) have also argued that pediatric well-child visits provide the best context for combating and preventing behavioral health problems—including OW/OB. Behavioral health is influenced by multiple types of family factors (environmental, relational, biological, etc.), requiring a more family-oriented style of intervention. This makes the pediatric environment, which already utilizes family-level tools and interventions, an ideal place to deal with children’s weight issues (Barlow, et al., 2007; McDaniel, Campbell, Hepworth, & Lorenz, 2005). This is especially true because the management of child OW/OB, unlike some other behavioral health problems, involves behavioral modifications that affect the entire family (Miller & Silverman, 2007). Childhood obesity is not solely a child weight problem, but also a problem facing the family in whose environment the child is situated. Pediatric well-child visits, therefore, may be the most opportune time not only to detect weight-related problems and obesogenic behavioral patterns in the family environment, but also for families to discuss information, advice, and strategies regarding obesogenic behaviors at both the child and family levels (Tyler & Horner, 2008).
Of course, not all pediatric visits occur in the same way. Differences such as provider characteristics and preferences, patient characteristics and preferences, and organizational policies can affect the content and structure of any clinical visit. There are, however, a few predominant models of primary care in current practice. The clinical practices driven by these models create the context and format in which communication occurs between parents and pediatric health care providers.
Models of Pediatric Care and Communication

In general, there are two types of patient needs in health care interactions: informational (i.e., cognitive), and emotional (i.e., affective) (Levetown et al, 2008; Tates & Meeuwesen, 2001). In pediatric interactions, these overarching needs exist both for parents and patients, albeit with potentially different goals. Parents come to well-child visits with two goals in mind (Radecki, Olson, Frintner, Tanner, & Stein, 2009). The first is to seek reassurance and encouragement, including positive feedback about their child’s growth and development, as well as their parenting skills. The second is to have an opportunity for discussion with their health care provider—to ask questions, raise topics of concern, and get more individualized attention and information that might not be available during a more time-constrained acute care visit. Cox, Smith, Brown, and Fitzpatrick (2009) reframe these two goals in terms of (a) information exchange and (b) relational development and maintenance. In order to meet these needs and goals, health care providers have to provide both instrumental (informational) and affective (relational) support during clinical interactions.

The way each of these is communicated during any medical encounter must be based on the specific needs of the patient/family and the purpose of the interaction (Tates & Meeuwesen, 2001). This kind of adaptive communication style, focused upon individual needs and preferences, is one of the central features of a model known as “Patient-centered care.”

Patient-Centered Care

Patient-centered care (PCC) is a type of interpersonal health care provision that focuses on treating each patient as an individual, instead of based on his or her demographic characteristics (Epstein, 2000). Patient-centered care has been broadly described as “care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions” (IOM, 2001a, p.6). Although there is general agreement about what PCC is and is not, it has proven to be a difficult concept to behaviorally define and operationalize. Looking across a greater number of proposed definitions and perspectives, Robinson et al. (2008) classified the elements of PCC based on two fundamental principles: “(a) a patient-provider relationship that promotes patient
involvement and (b) care that individualizes patient treatment” (p. 605, italics mine). The first category includes increasing patient education, family and patient involvement in care and decision-making, empowerment, and attention to patient goals, as well as forming a partnership between the patient and the provider, encouraging self-care, and providing adequate information. Individualized care includes having knowledge of the patient, having respect for the patient’s preferences and needs, understanding the patient’s concerns regarding the cost and convenience of care, attending to psychosocial issues, communicating effectively, having accessible care, and, of course, tailoring the treatment to suit the needs, wants, and values of the individual patient.

Although most working definitions of PCC incorporate a number of these issues, very few address all of them. There are, however, a few conceptualizations of PCC that attempt not only to explain the myriad factors involved, but also provide guidance for practitioners on how to deliver effective PCC. Probably the most influential, referenced, and utilized model of PCC comes from Stewart et al. (1995/2003), who provide a framework for implementing patient-centric principles into clinical practice.ii Essentially, Stewart et al. (1995/2003) argued that once physicians treat their patients as people, care becomes patient-centered.

Even though patient-centered care as a term is commonly utilized in health care settings, mainstream medical texts, and health services research, there is a profound lack of conceptual clarity and consistencyiii (Mead & Bower, 2000, 2002). One attempt at defining PCC, useful for conducting communication-based research (De Haes, 2006), framed it as (a) paying attention to patient psychological as well as physical needs; (b) facilitating the disclosure of patients’ concerns; (c) conveying a sense of partnership; and (d) actively facilitating patient involvement in decision-making. All of these are communicative in nature, and all, in one way or another, provide support to the patient.

Based on mounting evidence (e.g., Robinson et al., 2008; Street, Krupat, Bell, Kravitz, & Haidet, 2003), increasing numbers of medical researchers and providers are moving away from advocating a one-size-fits-all approach to PCC in favor of strategies which take into account and tailor communication based on patient preferences and needs for information sharing, participative decision
making, and interpersonal behaviors (Kiesler & Auerbach, 2006). This individualized communication profile would include knowledge of the patient’s beliefs, values, and illness profile/history, as well as demographic characteristics. Some communication researchers have advocated that providers must individually tailor their communication styles based on preferences or health information orientations of individual patients (Dutta-Bergman, 2005; Street, 1991). However, there still remains an active debate about the extent to which physicians, in order to truly be patient-centered, need to be flexible and adaptive in their communication style.

Patients differ in their expectations and preferences about information provision (both in amount and type), shared decisions, and interpersonal conduct in provider-patient relationships. Swenson, Zettler, and Lo (2006) and Swenson et al. (2004) found that patients not only had a distinct preference for either patient-centered or doctor-centered communication, but preferred a patient-centered approach over a doctor-centered one by about 2:1 (with roughly 69% preferring PCC). Interestingly, these preferences could not be predicted based on a single personal characteristic or demographic variable (Swenson et al., 2004). A similar result was found with regard to pediatric interactions, with 72% of parents (out of 466) preferring a shared decision making approach to pediatric care, rather than a more “paternalistic” doctor-centric approach (Merenstein, Diener-West, Krist, Pinneger, & Cooper, 2005).

Arguably, communication is what differentiates patient-centered from more traditional doctor-centered care. Bensing, Verhaak, van Dulmen, and Visser (2000) assert that communication provides the pathway through which providers can best attend to the needs of diverse individuals, who come into an interaction with their own needs and preferences. They argue that “patients are experts in the experience of their symptoms, and physicians are dependent on patients for this expertise” (p. 2) in making diagnoses and treatment plans. This communication includes the sharing, withholding, and/or negotiation of information and its effect on shared goals. Others have also argued for the centrality of communication in PCC. For example, Lambert et al. (1997) claimed that by definition, patient-centered care is necessarily a communicative construct. In other words, PCC is communicatively constituted, as opposed to being either the context in which communication occurs or a single facet of a larger process.
Family-Centered Care

The aforementioned conceptualizations of patient-centered care are, on the whole, dyadic in nature. The concept’s boundaries are challenged by interactions that also include family members or caregivers—such as when patients are very old, very young, or otherwise incapacitated and unable to advocate on their own behalf. In these kinds of health care interactions, and depending on the patient’s situation and participative abilities, the patient is not necessarily the primary target of the provider’s messages. In order to attend to the differences between dyadic patient-provider communication and that which takes place during patient-provider-family interactions (be they triadic or small group), the family-centered care approach (FCC) was developed.

Family-centered care is similar to patient-centered care in many of its core concepts, specifically (a) treating patients/families with dignity and respect (with regard to their experiences, backgrounds, and choices); (b) sharing complete information with patients/families in timely, unbiased, and affirming ways; (c) encouraging and supporting patient/family participation in decision-making, to the extent they desire; and (d) collaboration across all stakeholders in the development of care processes, policies, and facilities (Conway et al., 2006). However, because the incorporation of family members into the provision of pediatric care fundamentally alters the pathways and nature of communication during these encounters, the American Academy of Pediatrics Committee on Hospital Care, in partnership with the Institute for Family-centered Care, published a policy statement outlining recommended practices for the provision of FCC (AAP Committee on Hospital Care, 2003). Guiding principles include:

“Honoring racial, ethnic, cultural, and socioeconomic diversity and its effect on the family's experience and perception of care… Supporting and facilitating choice for the child and family about approaches to care and support… Ensuring flexibility in organizational policies, procedures, and provider practices so services can be tailored to the needs, beliefs, and cultural values of each child and family… Sharing honest and unbiased information with families on an ongoing basis and in ways they find useful and affirming… Collaborating with families at all levels of health care… Empowering each
child and family to discover their own strengths, build confidence, and make choices and
decisions about their health” (p. 692).

In 2006, the AAP iterated these ideas and made the integration between PCC and FCC more
concrete by discussing a “Patient and Family-centered” approach to pediatric care (PFCC) (AAP
Committee on Pediatric Emergency Medicine et al., 2006). This hybrid term covers essentially the same
parameters as the prior definition of FCC, while explicitly recognizing the relationship between the child
and his or her family, and situating the child within the context of that family environment. PFCC also
includes understanding the interdependent nature of the child-family relationship, while simultaneously
being aware of the child’s evolving independence over time. Pediatric patients, ranging in age from
newborn to eighteen, differ in their mental and emotional development, expressive ability, knowledge,
power, and decision-making authority. This creates an interesting dynamic between all parties involved
in the relationship—one that evolves over time as the child ages, and one that requires both flexibility
and understanding on the part of the health care provider.

In general, PFCC is a practical application of the findings from the research on patient-centered
care, extended to incorporate the value added by patients, family members, health care providers, and
organizational health systems. The AAP Committee on Hospital Care (2003) cites studies that
demonstrate how a family-inclusive patient-centered approach “can improve patient and family
outcomes, increase patient and family satisfaction, build on child and family strengths, increase
professional satisfaction, decrease health care costs, and lead to more effective use of health care
resources” (p. 692). None of these studies, however, seem to look at behavioral or biometric outcomes.

**Incorporating context and risk behaviors.** One model that relates PFCC specifically to
pediatrics obesity-related behavioral change is the family-centered collaborative negotiation model (Tyler
& Horner, 2008). The central feature of this model (see Figure 2) is the communication that occurs
between provider, parent, and child during the primary care visit. The patient and family-centered process
facilitates active participation, information exchange, mutual goal-setting, and support in working towards
behavioral change.
This model includes two other major factors that heavily influence the behavioral change process. The first is the child health profile, which consists of *contextual* (demographic and child-level factors) and *dynamic* (family-level and environmental) factors that influence the way communication takes place in clinical settings. The other important construct in the model is the inclusion of lifestyle health indicators (i.e., health outcomes). Instead of simply looking at child BMI (or other weight status metrics), this model forecasts outcomes in terms of the *risk-related behaviors that lead to changes in weight status*. These include exercise-related behaviors (e.g., activity level and duration), nutrition-related behaviors (e.g., fruit and vegetable consumption, calorie-dense vs. nutritionally-dense food consumption), and health-related quality of life (e.g., psychosocial consequences, ability to participate in activities, mobility). Essentially, this model situates the communication activities that take place during a well-child visit within the overall context of weight status as it plays out in the child’s life—taking ecological antecedents and behavioral outcomes into account. Although this model is valuable for its use of contextual factors and behavioral outcomes, it lacks *empirically-supported* detail about what really occurs during pediatric clinical visits, as well as specific ways in which these interactions affect obesogenic outcomes.

**Outcomes.** The real value of PFCC lies in the extent to which this style of care affects patient and family health and well-being. With regard to our discussion of childhood OW/OB, it is especially interesting to look at the effects of patient-centered communication on behavioral change and adherence to recommended treatments. For instance, Stewart (1984) found that physicians’ patient-centered behaviors (particularly those that encouraged patient participation and discussion) were positively associated with patient reports of compliance with treatment programs. This is consistent with Brody’s (1980) assertion that participative decision making leads to greater patient commitment to their decided-upon health-care regimes. Schneider, Kaplan, Greenfield, Li, and Wilson (2004) also found that patient-centered interpersonal behaviors, along with physician satisfaction and trust, significantly predicted medication adherence in patients with HIV, even after controlling demographic variables and levels of physical and mental health.⁴
We also know that patient/family preferences for participation in health care discussions and
decision making can affect multiple types of outcomes. Merenstein et al. (2005) found that the parents
who participated in shared decision making reported significantly higher levels of satisfaction with their
care, as opposed to those who experienced the more paternalistic approach ($p < .0001$). This is consistent
with other research indicating that parents value “open communication” with their pediatric health care
providers, specifically when pediatricians listen, attend to their concerns, demonstrate that they care about
the child, respect parent opinions, and ask questions (Heneghan et al., 2004).

**A Relationship-Centered Approach**

Accomplishing many of the stated goals of patient and family-centered care requires not only
effective and open multi-participant communication, but also the development and maintenance of
relationships between these participants over time (Stewart et al., 1995, 2003). It is frequently argued
that the relationship between a patient and a health care provider strongly influences provider-patient
interactions (Ballard-Reisch, 1990). The development and impact of these relationships on health
outcomes, however, is understudied within the both the communication and medical literatures.

There is a smaller movement of health care theorists focused more on the relational side of care
 provision—what they refer to as relationship-centered care (RCC) (Beach, Inui, & Relationship-
Centered Care Research Network, 2006). At its core, an RCC approach integrates interpersonal
communication and ecological modeling, not just to the provision of effective healthcare, but to the
greater system of healthcare practice.’ RCC is, in part, founded upon the principle that the clinician and
the patient have a reciprocal relationship, based on mutual influence and benefit (Beach et al., 2006). For
these interactions to be relationship-centric, they must be of value—not just therapeutically, but also
emotionally and morally—to all parties involved.

Although very little research has been conducted to either evaluate or validate a relationship-
centered approach (or even operationalize it into quantifiable practices), there are key aspects worth
taking into account when developing more robust models of PFCC. The first is that a relationship-
centered focus is *inherently communicative* in nature. There is no way to separate the relationship from
the communicative acts that serve to recursively create and re-create it over time. This leads to the second factor—that a relationship-centered approach is necessarily longitudinal in scope. Relationships form over time, and cannot be fully assessed within the boundaries of a single interaction. This puts RCC at odds with much of the current research on patient-centered care, which relies heavily on single-observation and one-time cross-sectional survey data.

A relationship-centered approach is useful in that it emphasizes the reciprocal and mutually influential nature of these relationships—not just that each person/entity continually influences the other, but that each communicative act or behavior reciprocally influences all acts or behaviors that follow (Street et al., 2003). This model of care was explicated and visually depicted by Suchman (2006), who described these “iterative reciprocal interactions” as the basis for the development of “shared patterns of meaning and relating” (p. S41) between the parties—especially with regard to shared understandings of patient care practices. This reciprocal process may help explain why, in some longer-term provider-patient/family relationships, the effects of race and gender may dissipate over time (Cooper et al., 2003). Patient preferences regarding care may also change as these relationships develop and mature.

A relationship-centered approach also converges upon the concept of perceived autonomy support, a central concept in self-determination theory (Deci & Ryan, 1985; Williams, Frankel, Campbell, & Deci, 2000; Williams, Rodin, Ryan, Grolnick, & Deci, 1998). In the context of provider-patient interactions, autonomy support refers to a cluster of communicative behaviors that positively connect RCC, patient motivation, and health outcomes. These include taking patient perspectives into account, providing information and clear explanations/rationales for recommendations, allowing patients to freely express issues and concerns, offering real choices to the patient, and accepting those choices for care. The argument is that increased autonomy support by physicians will lead to increased patient motivation and active participation in health care interactions, which in turn will lead to the adoption of positive health behaviors and better health outcomes. Empirically, perceived autonomy support has been linked to more active participation in health care interactions, as well as increased adherence to behavioral and pharmacological treatment plans (Williams, Grow, Freedman, Ryan, & Deci, 1996;
Williams et al., 1998). Demonstrated health outcomes in adult populations have included long-term weight loss, glucose control in diabetic patients, and smoking cessation (Williams, Gagne, Ryan, & Deci, 2002; Williams et al., 1996; Williams et al., 1998).

One interesting feature of Williams and colleagues’ (2000) self-determination approach to relationship-centered care is the inclusion of families in the healthcare relationship—not just providers and patients. They believe that because research strongly demonstrates that patient-family interactions affect health outcomes, it is crucial that physicians not only provide autonomous support to patients, but encourage their family members to provide autonomous support as well. They assert that providers need to be attentive to, understand, and positively influence the patient’s “family dynamics” in order to provide effective care.

Even though there is little long-term research reporting effects of provider-patient/family relationships on behavioral health outcomes, it could be argued that focusing on health care relationships, and the goals and needs of all parties who enter into them, bypasses negatively-perceived power imbalances (based on status differences between physicians and patients; Lambert et al., 1997), thereby creating an increased sense of partnership and enhancing the strength and efficacy of provider-patient communication. Through these mechanisms, in combination with the enactment of PFCC, these relationships may facilitate beneficial health outcomes. In other words, by focusing on the development of mutually influential provider-patient relationships, instead of the characteristics and behaviors of “patients” and “providers,” it may be possible to facilitate increased adoption of recommended health behaviors.

Ultimately, from a patient, family, and/or relationship-centered care perspective, the main purposes of primary care providers’ interactions with families are not only to provide direct care during the clinical visit (in terms of diagnostics, tests, procedures, referrals, etc.), but also to provide families with the tools they need to make health-related decisions and engage in healthy behaviors outside of the clinical setting. This latter purpose can be conceptualized in terms of providing support to the families. This support may be informational in nature—providing information to facilitate parent/patient
understanding, motivation, or behavioral change—or relational, in terms of understanding the
patient/parent’s needs and values and communicating in a personalized family-centered manner that is
respectful and takes into account personal history, levels of health literacy, and cultural norms. It also
includes providing autonomy support, which means actively empowering family members to make good
health care decisions for themselves and dependents.
Health is a subjectively defined concept (Epstein et al., 2005)—different for every person, and different within the same person at different points in life. A patient might see him- or herself (or a parent may see his or her child) as “healthy” when a physician does not—or vice versa. These differences in perception (affected by multiple contextual factors, such as personal/family history, media messages, and ethnic/cultural norms) affect the way goals are set, behaviors are adopted, and treatment adherence is maintained. Just about every aspect of the health care experience (e.g., past experience, personal characteristics, physical environment, communicative acts, the time of day) can affect individuals’ perceptions of a clinical interaction, how they interpret the information received, and how they behave in the future. These perceptions alter the issues that patients and providers raise during consultations, and the importance attributed to each issue at that time (Rimal, 2001).

The importance of perceptions. Epstein (2006) argued that the patient’s subjective assessment is what affects future communicative acts and health behaviors, regardless of what may have objectively transpired. For instance, a comment made by a physician might be categorized by a trained observer as an interruption. However, potential affective consequences of that interruption will only occur if that patient feels interrupted. Epstein (2006) also noted that individuals interpret the meaning of interruptions in different ways—some positive and facilitating, some negative and inhibitory—producing different communicative effects. A verbal or nonverbal display of confidence from a provider may mean one thing to that provider (perhaps communicating expertise) and another to the patient (not attending to patient concerns, or coming across as overconfident). Research also indicates that patients’ perceptions may be influenced as much or more by non-communicative factors (e.g., attitudes, values, demographics) than by actual interactions (Cooper et al., 2003). Based on this literature, Robinson, Callister, Berry, and Dearing (2008) argued that “the patient is the sole determinant of patient-centeredness. Although observable characteristics may indicate the presence of a patient-centered interaction, unless that is the patient’s perception, it really is not patient-centered” (p. 603).
There is some evidence that objectively-measured events in interactions may not have the same impact on health outcomes as do patient perceptions of those events. In a landmark study, Stewart et al. (2000) examined the relationship between PCC behaviors and patient outcome variables ($N = 297$ clinical interactions). They found that while patients’ positive perceptions of the communication that occurred were significantly associated with decreased levels of discomfort, decreased levels of concern, increased mental health, fewer additional diagnostic tests, and fewer referrals to additional physicians, the communication coded from audiotapes of the actual interactions (by trained objective researchers) did not significantly predict any of these positive outcomes. Ultimately, the patients’ perceptions were a better predictor of health outcomes than the objectively-determined “patient-centered communication scores”.

**The parental role in pediatric communication.** In pediatric interactions involving young children, it is not necessarily the perception of the child (patient) that matters most, but the perception of the patient’s parent. In general, parents have more control than their children when it comes to pediatric interactions, specifically over informational content and decision making (Tates, Elbers, Meeuwesen, & Bensing, 2002). Parents of young children usually take on the mediator role in patient-provider interactions, communicating almost exclusively with pediatric providers on their child’s behalf. In general, parents act as gatekeepers of information for their children—setting informational boundaries, controlling the flow of information, and presenting their child’s health information (e.g., symptoms, problems, history) even when not explicitly asked to do so by the provider or child (Tates et al., 2002; Young, Dixon-Woods, Windridge & Heney, 2003). Research has demonstrated that even though they are normatively depicted as triadic (McDaniel, et al., 2005; Tyler and Horner, 2008), clinical interactions involving young children are almost completely dyadic (provider-parent), becoming more triadic only as children mature (Cox et al., 2009; Garth, Murphy, & Reddihough, 2009; Van Dulmen, 1998). It is only once children reach about age 13 that they do the majority of speaking with providers when parents are present (Cox et al., 2009).

Parents are also important participants because they have more power than their children when it comes to making decisions about and enacting health-related behaviors, such as those affecting child
weight status (IOM Committee, 2011). Parents have a large degree of control over what happens in the family environment, a key contextual factor influencing child OW/OB and one that is usually discussed in provider-parent interactions about child OW/OB (Hendrie, Coveney, & Cox, 2011; Lloyd, Lubans, Plotnikoff, Collins, & Morgan, 2014; Tyler & Horner, 2000). Features of this environment include the behavior of other family members, family values/attitudes, access to resources, media exposure, stressors and family life events, and the physical environment of the home (e.g., whether there is a television in the child’s bedroom). Parents also model behavior, heavily influencing their children’s patterns of diet and activity, and act as gatekeepers, determining the type and amount of foods available in the home (IOM Committee, 2011). Because of these influences, child health theorists argue that all pediatric care recommendations must be directed at parents and focus on the family context, as this is where the majority of child behaviors, attitudes, and values are generated (McDaniel et al., 2005). Facilitating change in the family environment, especially when it comes to difficult issues like food and physical activity, is not an easy task for pediatric health care providers to undertake.

The Provision of Weight-Related Information in Pediatric Interactions

Child weight is a tricky issue for pediatric health care providers to successfully address, for there are many barriers to diagnosis, discussion, and treatment (Moore & Kirk, 2010), including those related to the family environment. Although OW/OB is a physical condition with direct and indirect consequences, its diagnosis is, in many ways, both subjective and socially constructed. Unlike traditional somatic diseases that can be diagnosed with a physiological test, a diagnosis of obesity (without comorbid disorders like type 2 diabetes or hypertension) is primarily a descriptive indicator of potential disease—a risk factor for a cluster of physical and psychosocial problems. The use of BMI charts provides a standard diagnostic benchmark for formal diagnosis, but it is not always used in clinical pediatric practice (Moyer et al., 2005). The social stigma connected with being “fat” prevents many providers and parents from even discussing the subject, especially within earshot of the child (Mikhailovich & Morrison, 2007; Puhl & Latner, 2007). Cultural norms also shape the way parents perceive child weight and weight gain, strongly affecting their desire to change (Baughcum, Chamberlin, Deeks, Powers, & Whitaker, 2000;
Williamson et al., 2006). Some parents, believing their child to be a healthy weight, mistrust any health care provider who attaches the OW/OB label to their child (Baughcum et al., 2000; Jain et al., 2001). Even for those who accept the diagnosis and believe it is a problem that needs to be changed, the treatment involves lifestyle changes not just for the child but for the entire family. Given all of the family-level factors that contribute to childhood OW/OB, this is a task that can feel too challenging for many parents to undertake.

**Guidelines and recommendations for healthy child weight.** Although it may be a frustrating topic for providers and parents, discussions of weight-issues during pediatric visits can have a significant effect on weight-related behaviors (e.g., Kant & Miner, 2007). As such, there are mounting expectations that primary health care providers address weight-related topics in clinical visits. For example, the U.S. Government’s “Healthy People 2020” guidelines (which sets forth a detailed data-driven agenda for improving the health of all Americans) includes the goal of “increasing the proportion of physician visits made by all child or adult patients that include counseling about nutrition or diet” from 12.2% to 15.2% by 2020 (HHS, Nutrition and Weight Status, 2014, sec. NW-6.3). Many public health advocates, researchers, clinicians, and health organizations have developed and/or endorsed guidelines designed to help pediatric health care providers communicate this weight-related information to their patients and their families. These include professional associations like the American Academy of Pediatrics (AAP, n.d., What Health Professionals Can Do), the American Medical Association (AMA, 2011) and the American Heart Association (Daniels et al., 2009); private organizations and foundations such as Trust for America's Health (Levi et al., 2013) and the National Institute for Children’s Health Care Quality (NICHQ, 2014, Obesity); and groups of medical professionals published in peer-reviewed journals (e.g., Davis et al., 2007).

Although each of these sources frames the problem in a slightly different way, with different implications for how providers should behave and communicate with their patients, the different recommendations are, on the whole, quite similar in scope and content. Part of the reason for the overlap is that many recommendations are based upon a report issued by the “Expert Committee on the
Assessment, Prevention and Treatment of Child and Adolescent Overweight and Obesity” (AMA, 2007; Barlow et al., 2007). The appendix to this report contains a detailed list of protocols for the assessment, treatment, and prevention of childhood obesity in children from age 2 to 18. These recommendations provide explicit advice for not only the types of diagnostic tools and criteria to use, but also what kinds of information to provide to patients/families to help them engage in obesity-reducing/prevention behaviors (including nutrition, eating behaviors, physical activity, screen time, maternal health, and parenting styles).

In general, all of these clinical recommendations list the assessments that should be undertaken (e.g., annual BMI screening, family medical history, dietary intake questions) and behaviors that the patient/family should be told either to engage in or avoid. For example, the American Medical Association (AMA, 2011) states that during well-child visits, pediatricians should tell parents to limit the consumption of sugar-sweetened beverages, energy-dense (high-calorie) foods, restaurant meals, portion sizes, and media consumption (TV/screen time). Parents should also be encouraged to have their children eat nine servings of fruits and vegetables every day, eat breakfast daily, eat family meals, get 60 minutes of moderate activity every day, eat foods containing calcium and fiber, and eat an appropriate balance of protein, carbohydrates, and fat.

**Diagnosing overweight and obese children.** In addition to providing suggestions to reduce OW/OB risk, providers are expected to perform BMI screening for OW/OB. Since 2003, the federal government and the American Academy of Pediatrics (AAP) have recommended screening all children (starting at 2 years old

[8]) for overweight/obesity at well-child visits using BMI and growth curves

[9] (AAP Committee on Nutrition, 2003; AAP, n.d., What Health Professionals Can Do; HHS, Nutrition and Weight Status, 2014). It is also recommended that pediatric providers address the issue with the parent(s) at well-child visits, when there is more time available to discuss parental perceptions, behavioral recommendations, and the family context. This is consistent with the policies of the American Medical Association (AMA, 2011), the recommendations of the Institute of Medicine (Koplan et al, 2005), and with the aforementioned Expert Committee report (Barlow & the Expert Committee, 2007).
As expected, the use of BMI percentiles significantly increases the accurate identification of children who are overweight. One study found that during well-child visits, BMI screening significantly increased pediatricians’ identification of overweight children (85th-94th percentile), only 27% of whom would have been diagnosed based solely upon the physicians’ visual assessments (Barlow et al., 2007). Pediatricians were, however, able to accurately visually identify children who were already obese (at or above the 95th percentile) much more so than those only categorized as overweight. Other studies have also found that overweight children are diagnosed and treated at a significantly lower rate than obese children. For instance, Benson et al. (2009) analyzed the medical records of 60,711 children over an 8-year period and found that of all children who were overweight or obese at any point during the study (totaling 25,382), only 34.1% were formally diagnosed. Of this number, only 9.5% of overweight children were diagnosed, as compared with 53.8% of obese children, and 75.6% of “severely obese” children (those in the 99th percentile). Taken together, these studies indicate that BMI screening greatly increases the likelihood that children will be treated for a weight issue before they get to the point of being clinically obese.

Interestingly, in a review of electronic medical records, Benson et al. (2009) also found that accurate diagnoses (officially diagnosing those with BMIs meeting the diagnostic criteria for OW/OB) were influenced by documented family history of obesity, race, gender, child age, a pattern of increasing BMI scores, and the number of visits where the child’s BMI had been in the overweight range. Specifically, children were significantly more likely to be correctly diagnosed when they were Black, Hispanic, female, or older. In addition to demonstrating that diagnosing obesity is, in practice, a more complex process than simply noting a child’s height and weight, these findings indicate that pediatric providers look for weight-related factors within the context of that child’s case history, as well as how the child’s BMI trends over time. For instance, they may be less likely to make a diagnosis after a single office visit, or with younger children who have not yet exhibited a worrisome pattern. In other words, diagnosis is affected by information gathered over time.
Discussing weight: benefits and barriers. Does it really matter if a child is diagnosed as overweight or obese by his or her health care provider? Evidence suggests that it does. Barlow et al. (2007) found that formally recognizing a child as overweight or obese significantly predicted increased time spent discussing diet and exercise during that appointment. In other words, identification of OW/OB status facilitates discussion of risk factors. These discussions of weight-related topics may, in turn, affect the ways that parents view their child’s health and the family’s health behavior. For instance, having pediatricians explicitly tell parents about the health consequences of their child’s weight significantly increases the likelihood that parents will be willing to change their family’s obesogenic behaviors (Rhee et al., 2005). This suggests a motivational benefit to clearly communicating the health risks associated with a child’s BMI during a well-child visit.

So if it might help with obesity-related prevention and treatment efforts, why not screen every child? Some researchers have argued that perhaps health care providers do not want to screen because they do not feel there are enough effective therapies for overweight/obese children, and what tools they have are limited in efficacy because they feel they cannot effectively communicate with parents about them (Krebs, 2005). Although most pediatricians say they have enough time to do the BMI assessment, Klein et al. (2010) found that two-thirds (of the 677 surveyed) believe they do not have the time to counsel family members and thoroughly discuss the assessment results.

Arguments supporting the use of BMI screening in the effort to treat child OW/OB assume that practitioners will, in fact, discuss issues of child weight with their patients and families. However, many pediatric health care providers simply do not feel empowered to effectively deal with this issue during well-child visits, due to the overwhelming influence of social, cultural, community, and familial factors related to food consumption and exercise behaviors (Homer, 2009; Spivack et al., 2010). For instance, one study revealed that even though 59% of pediatricians believe parents want to discuss weight issues, only 50% actually thought parents would address the issues if they were brought up at an appointment (Klein et al., 2010). The vast majority of providers simply do not believe that parents and/or children are motivated to make significant changes in their behaviors (Spivack et al., 2010). In another study, although
the vast majority of health care providers \((N = 939)\) saw childhood overweight/obesity as a concern in their practice, nurses and pediatricians tended to see the treatment of overweight/obesity as “futile” (Story et al., 2002). These types of beliefs negatively affect the way that obesity-related concerns are communicated during appointments (Klein et al., 2010; Perrin et al., 2007).

The age of the child also appears to be a factor in how providers perceive weight issues and how they choose to communicate (or not communicate) with parents about them. In one study \((N = 150)\) only 10% of overweight (3 of 29) and 30% of obese (6 of 20) preschoolers’ parents had ever been told by their child’s health care provider that their child was overweight or gaining weight too rapidly (Hernandez et al., 2010). According to these parents, pediatricians were three times more likely to discuss a child’s weight issues in well-child visits for preschoolers aged 3 years and older than they were for younger children. The authors suggest that their findings indicate “providers’ lack of awareness of obesity risk or discomfort in discussing healthy weight with younger children” (Hernandez et al., 2010, p. 797).

There are other reasons pediatric health care providers do not discuss weight issues in their clinical practice. These include lack of time (Boyle, Lawrence, Schwarte, Samuels, & McCarthy, 2009; Klein et al., 2010; Perrin, Finkle, & Benjamin, 2007); insufficient reimbursement for treatment (e.g., Boyle et al., 2009; Story et al., 2002); fear of offending parents (Barlow et al., 2007); and general discomfort in discussing weight-related issues, especially when parents are themselves overweight (Mikhailovich & Morrison, 2007).

For those practitioners who do discuss weight-related topics during well-child visits, there is much variation in the type and amount of weight-related information provided during well-child visits. For example, one survey found that 65% of 248 pediatric health care providers reported always discussing issues of diet and exercise during well-child visits; however, only 50% discussed limits on TV/screen time (Boyle et al., 2009). Spivack, Swietlik Alessandrini, and Faith (2010) found that in another hospital system, the majority of providers (79% of 192) spent at least 3 min discussing topics related to dietary intake and physical activity with families of preschoolers. Although almost all of the providers brought up
juice and fruit and vegetable consumption, just 45% discussed exercise and less than 35% talked about sweets, fast food, or TV viewing.

Most sets of recommendations for health care providers specify the type of information that should be given (based on child age and BMI) and provide timelines for dissemination. What they do not discuss is how pediatric health care providers should communicate this information so parents and children will understand and use it when making daily decisions about obesogenic behaviors. A few scholars and practitioners (e.g., Mikhailovich & Morrison, 2007; Murray & Battista, 2009) have compiled lists of specific suggestions for enhancing pediatric communication about child weight (including logistics, interpersonal features, message delivery strategies, and message design/content). The suggestions, as practical as they might be, are not driven by any sort of theory/ideology, and are not tested via empirical research. They are also not integrated into the specific recommendations given to pediatric health care providers by mainstream medical institutions and governing bodies (e.g., AAP, AMA, HHS, CDC, or IOM). The basic assumption underlying these mainstream anti-obesogenic recommendations, across sources, is that the mere provision of this information/advice during pediatric consultations will result in the desired behavioral effects over time.

Parental Perceptions of OW/OB

Again, the belief among many physicians and nurses that discussing child weight and weight-related behaviors with parents is essentially a futile effort comes, in large part, because they perceive a lack of involvement (Story et al., 2002), low motivation to change (Perrin et al., 2007; Story et al., 2002), and/or active resistance (Boyle et al., 2009) from patients and parents. There are many reasons why parents may not want, or feel no need, to discuss their child’s weight during medical appointments. There is, first of all, some likelihood that the parent does not perceive their OW/OB child to be overweight—a factor that has been shown to affect both weight-related counseling in pediatric settings and subsequent behavioral change (Baughcum et al., 2000; Hernandez et al., 2010; Young, Schwartz, Monsur, West, & Neale, 2008). This may either be the result of parents’ inability to identify their children as overweight or to fully understand the health consequences of obesity (Hernandez et al., 2010; Perrin et al., 2007).  

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Whether this is due to a reporting bias or a true misperception is unclear, but it does indicate an awareness gap that could be problematic when trying to motivate parents to engage in lifestyle change.

It could also indicate parental unwillingness to have their child classified as overweight, in order to avoid social stigma (Mikhailovich & Morrison, 2007; Puhl & Latner, 2007). Such misperceptions have also been attributed to other factors, such as low maternal education (Baughcum et al., 2000) and maternal BMI (Warschburger & Kroller, 2009), even when controlling for other demographic characteristics. For example, overweight mothers often attribute their child’s weight issues to genetics, and believe it is to be expected that their child will be overweight (Baughcum, Burklow, Deeks, Powers, & Whitaker, 1998). Because these parents have had to make sense of their own weight status, which may not have caused them physical or social difficulties in the past, they may be less likely to see the potential health risks involved or feel less compelled to change family behaviors.

There is also substantial evidence that the cultural and ethnic background of the parent is related not only to rates of OW/OB (CDC, 2011a; Ogden et al., 2014) but also to parents’ perceptions of children’s weight (Fitzgibbon, Blackman & Avellone, 2000; Sonneville, LaPelle, Taveras, Gillman & Prosser, 2009). These authors argue that ethnicity-based cultural norms have an impact on body image, which can, in turn, affect how weight-related recommendations are interpreted and adopted in changing obesogenic behaviors. Many of these cultural norms embody not only what it means to have a “healthy” child, but also what it means to be a good parent. For instance, Baughcum et al. (1998) found that some mothers (in this case low-income women receiving WIC supplementation) wanted their children to weigh more because they believed it meant the child was healthier (“bigger is better”) and it reinforced their image (both self-image and as perceived by others) as a good parent.

Interestingly, Hernandez et al. (2010) found that the parental perception that pediatricians failed to discuss weight issues during well-child visits to be the single largest bivariate predictor of parental underestimation of child weight. This factor remained the only significant predictor in the multivariate model with child gender, child age, parent age, parent education, and parent BMI ($p = .01$, $OR$, 12.3; 95% CI, 1.74-87.2). This offers the possibility that if pediatric health care providers simply raised the issue of
childhood overweight with more parents, the parents, in turn, would be better at visually identifying their child’s overweight/obese status, which (combined with an understanding of potential negative health outcomes) might in turn lead to the adoption of anti-obesogenic behaviors by family members.

In sum, the previously covered research on parental perceptions suggests that parents must perceive that this provision has occurred for it to be helpful. The potential effects of perceived recommendations also need to be observed over time, as true behavioral change (resulting in habit formation and revision) is not often an immediate process (Prochaska & DiClemente, 1983, 1998; Prochaska et al., 1994). Thus, I predict:

**H₁:** The amount of weight-related information parents believe they received from their providers at baseline (Time 1), specifically the number of recommendations given and mention of the risks/consequences of being overweight, should negatively predict child obesogenic behaviors and positively predict anti-obesogenic behaviors one year later (Time 2).

Even though this argument underlies many of the current pediatric obesity-prevention recommendations, the basic provision of information may not account for the greatest degree of treatment adherence or behavioral change. In other words, just because a doctor tells a parent to do something or to have his/her child do something, it does not necessarily mean that it will be done, even if the parent receives the message.

Given the likelihood that the mere provision of information is not enough to inspire and motivate weight-related behavior changes in families with preschool-age children, it is important to determine what other factors present during pediatric well-child visits might increase the likelihood that a family will adopt a health care provider’s anti-obeseogenic recommendations. The framework representing the informational and relational factors hypothesized to affect obesogenic/anti-obesogenic behaviors, and ultimately child BMI, is represented in Figure 3. These hypotheses will be explicated further in the following sections.
The Additional Value of Relational and Informational Support

Given the complexity of child OW/OB, it seems doubtful that an information-only approach would be sufficient. Even when weight is discussed during pediatric visits, and families are made aware of the potential health implications of OW/OB, parents still may not have the willingness, readiness, ability, or resources (e.g., informational, financial, social) to make recommended behavior changes. Major barriers to the implementation of obesity-related recommendations include but are not limited to economic factors (e.g., time, cost, and transportation), family preferences (habits of the child and other family members), lack of information, and poor access to resources (Sonneville et al., 2009). Other barriers reported by parents of young children include children’s refusal to eat healthy foods (especially vegetables), parents’ difficulty in limiting screen time, parents’ unwillingness to limit children’s intake of 100% fruit juice (believing it has no role in child weight gain), and parents’ belief that “educational” TV programming is good for children and therefore should not count toward the limits for screen time (Bolling, Crosby, Boles, & Stark, 2009). These findings illustrate the necessity of understanding how parents’ perceptions of and value attached to pediatric communication about child weight affect tangible long-term health outcomes in children.

**Adherence and support.** One way to study the impact of these provider-generated recommendations on health behaviors is to conceptualize them in a manner consistent with research on pediatric treatment adherence. Adherence [“the accurate observance by a patient of a prevention or treatment regimen set out by a health professional” (DiMatteo, 2004, p. 340)] in pediatric contexts requires the enactment of particular behaviors from the child, who must fully participate in the administration of the treatment, and of the parent, who facilitates the performance of these behaviors to varying degrees, depending upon on the child’s stage of development and medical situation. Although at first glance adherence may seem to be strictly a behavioral issue, the trajectory of adherence behaviors is rooted in the treatment-related interactions that take place during clinical visits. In other words, adherence is also a communicative issue (DiMatteo, 2004).
Greater levels of parental knowledge do not necessarily result in increased adherence and behavioral adoption (DeCivita & Dobkin, 2004). Because many necessary behavioral changes require time and effort (for parent and/or child), and because a recommended behavior might negatively affect the child’s or family’s quality of life, parents may feel they are making the best choices for their children by NOT adhering to recommended treatment plans, especially treatments that do not have immediate positive consequences (Conn, Halterman, Fisher, Yoos, Chine & Szilagyi, 2005). Other major barriers to pediatric adherence include: difficulty with the treatment plan (e.g., cost, logistical difficulties, complexity, side/adverse effects); lack of discussion time in clinic (e.g., not enough time to explain treatments, ensure understanding, or elicit concerns); lack of familiarity between the provider and the family/patient; parent/family characteristics (e.g., health literacy, culture, education level, socio-economic status, environment, family communication); and organizational barriers (e.g., continuity of provider care, insurance, availability) (Winnick, Lucas, Hartman, & Toll, 2005). In addition, if the benefits of adherence to behavioral recommendations are not immediate or tangible, with consequences not occurring until years after the initiation of the behaviors, it can be much more difficult to motivate behavior change (DeCivita & Dobkin, 2004; DiMatteo, 2004; DiMatteo, Giordani, Lepper, & Croghan, 2002).

Health care providers can increase adherence in spite of these barriers by focusing on certain relational communicative factors including: (a) information provision (specifically communicating for understanding, not just acceptance); (b) developing trust within provider-parent-child relationships; (c) understanding parental beliefs and attitudes; (d) clearly communicating expectations; (e) discussing socio-emotional factors (e.g., anxiety, coping, depression); and (f) providing interpersonal/social support (DiMatteo, 2004). This list reinforces the point that motivating adherence involves more than just the provision of information, recommendations, and treatment plans. It also has to be communicated in such a (family-centered) way as to be perceived as valuable by the parent. Otherwise, the parent will likely not adhere to the recommendation.

Effective communication of information can been seen as a form of support to parents (and patients), as it should be a useful tool in a parent’s ability to make health care decisions about treatment
plans (including potential behavior modifications). The other facilitators of adherence described above can be thought of as types of relational support, as they help create the foundation upon which provider-parent-child relationships are created, and provide the communicative mechanisms through which these relationships are sustained over time. In other words, increasing adherence for any behavioral plan (within the framework of patient and family-centered care) requires both informational and relational support. Assessing parents’ perception of these types of supports involves measuring both perceived value of information and perceived value of the provider-parent-patient relationship. These constructs are explicated further below.

**The perceived value of information.** According to the principles of PFCC, the communication of health information must be managed and tailored in such a way that the content is specific to the parents’ and/or patients’ needs, is useful in their decision making, and facilitates their treatment adherence efforts (Beach et al., 2006). Although parents believe quality of care can be improved with a greater exchange of information (Bolling et al., 2009), the content and way it is shared also make a difference in how parents interpret and use information in making health behavior decisions for their families. Research has demonstrated that parents want more information about their children’s health and treatment options, and that they prefer this information to be presented in a hopeful and positive way (Levetown et al., 2008; Perrin et al., 2007). Pediatric health care providers also need to show genuine interest in the children and the family, speaking in positive and supportive terms about the family and members’ ability to make recommended behavioral changes (Bolling et al., 2009; McDaniel et al., 2005; Pagnini, Wilkenfeld, King, Booth, & Booth; 2007). Research also indicates that parents of young children want their pediatric providers to not only make behavioral recommendations, but to clearly explain the reasoning and research behind the recommendations, to better understand their value (Bolling et al., 2009).

In discussions of weight-related topics, the specific ways in which pediatric health care providers communicate make a difference in how parents value, interpret, and use the information given. For instance, parents in one study reported that they would prefer their pediatric health care providers to use
the terms “overweight” and “obese” rather than the more ambiguous term “at risk,” or more colloquial terms (like “plump” or “big for age”), as the former terms convey a stronger need for concern (Bolling et al., 2009). On the other hand, Eneli et al. (2007) found that a different sample of parents strongly preferred use of the description “gaining too much weight” over the use of labels like overweight or obese. These conflicting findings about language use, and the need to connect the message to the family’s specific situation, collectively demonstrate the ways in which a provider’s knowledge about a family can increase or decrease the perceived value of a weight-related communication. Respect for the parent and the parent’s knowledge of the child must also be incorporated into the way information is framed during well-child visits (Heneghan et al., 2004) to maximize perceived value. For instance, providers need to present growth chart data in a respectful and sensitive manner, so as not to unintentionally communicate that the parent is incompetent or neglectful (Baughcum et al., 1998). Given that parents see pediatric health care providers as an important resource for information on weight-related topics and advice on the prevention and treatment of childhood OW/OB (e.g., Pagnini et al., 2007), the extent to which they value the information they receive from their providers (in terms of the quality, quantity, and usefulness) should be associated with a greater likelihood of enactment of healthy weight-related behaviors.

\[H_2: \text{The amount parents value the quality, quantity, and perceived usefulness of the weight-related information provided by their pediatric health care providers at baseline (Time 1) should negatively predict child obesogenic behaviors and positively predict anti-obesogenic behaviors at Time 2.}\]

**Relational support and value.** Relational development and maintenance are key factors in the study of provider-patient and provider-parent-child communication, and therefore need to be considered heavily when investigating the mechanisms that influence the adoption of recommended changes in obesogenic behaviors. Both family and relationship-centered care models emphasize that a key factor in successful triadic pediatric communication is not the behavior of any one party, but rather the nature, strength, and continuing development of the parent-patient-provider relationship. Throughout the United States, pediatric physicians and nurse practitioners universally emphasize the importance of developing
parent-patient-provider relationships because it allows them to understand families’ priorities and better individualize the care they provide (Tanner, Stein, Olson, Frintner, & Radecki, 2009).

Even though relationship development and maintenance are perceived as important, physicians still spend the vast majority of time during pediatric interactions giving information and directives to the family, and little time engaged in partnership-building, socioemotional talk, or explanations of recommendations (Nunes & Ayala, 2009; Street, 1992). Although pediatricians’ overall communicative contributions during the well-child visit, including the provision of information, may increase parental participation in the interaction (Howell-Koren & Tinsley, 1990), the lack of relationship-building may undermine the way the information is interpreted and used by parents and children in their behavioral choices. For families of children with health issues, particularly chronic problems, their pediatric health care provider may be seen as a source of continuity and support, based on their deeper and more long-standing relationship with the family and the child (Carter, 2002). These relationships continue to develop and change over time, especially as children age (Garth et al., 2009).

Based on models of patient, family, and relationship-centered care, we can extrapolate some of the most important factors upon which parents might judge the quality of their relationships with their pediatric health care providers over time. These include providers’ demonstrated knowledge of the patient’s history, understanding of the family’s values, interpersonal treatment, support of family decision-making, trust, and overall satisfaction. Each of these factors has already been demonstrated to affect treatment adherence (as reviewed in DiMatteo, 2004), and therefore it is reasonable to expect that they would similarly affect perceptions of provider-parent relationships.

The perceived quality of the parent-provider relationship also appears to be a prominent factor in parental acceptance of provider recommendations. Parents report not wanting to receive advice from a pediatrician unless it is one with whom they have had a “long-term trusting relationship… (who) makes them feel comfortable, expresses care and concern for the entire family, and shares some of their core values” (Dumont-Mathieu et al., 2006, p. e845). Engaging in relational development promotes information sharing and parent trust, which in turn facilitates providers’ ability to take individual/family
preferences and cultural values into account (Levetown et al., 2008). In general, parents seem to trust their children’s pediatricians when it comes to health issues. They display more trust for providers who communicate that they value parents’ opinions, respect and support their values, and take the time to listen to their concerns (Heneghan et al., 2004).

When it comes to interactions with their pediatric health care providers, parents mostly want to be able to make suggestions and participate in decision making, feel safe expressing issues and frustrations without being judged, have the provider show respect for their experience and knowledge of their child, receive emotional support and affirmation, and receive personalized attention and information based on the provider’s understanding of the parent’s values, concerns, and situation (Garth et al., 2009; Heneghan et al., 2004; Levetown et al., 2008; Pagnini et al., 2007; Radecki et al., 2009). Pagnini et al. (2007) found that with regard to the discussion of weight-related issues, parents wanted the provider to do more than provide information. These parents said they wanted support in their parental role, emotional engagement, and relevant advice.

A perceived lack of respect, understanding, or trust, however, has been shown to hinder parents’ ability to communicate with their pediatric health care provider, as well as their willingness to adhere to behavioral treatment recommendations. Some parents report not wanting to discuss behavioral topics (especially those that are emotionally-charged) with their pediatricians for fear they will be judged (Dumont-Mathieu et al., 2006). This feeling is often rooted in the belief that the doctor feels they are an unfit parent, thinks the parent’s perspective is naïve, doubts their reports/interpretations of the child’s experience, or lacks respect for the parent (Carter, 2002; Heneghan et al., 2004). Although some of these factors are influenced by a perceived power differential between provider and parent (Parrott, Burgoon, Burgoon, & LePoire, 1989), many of these issues reflexively create and are created by a lack of trust in the provider-parent relationship (Dumont-Mathieu et al., 2006).

It makes sense then, that practitioners would focus their attention on achieving high levels of patient (or in this case, parent) affect from health care interactions or relationships, and that researchers would want to examine the results of those positive feelings. Across multiple studies, patient-centered
communication practices have been associated with higher levels of patient satisfaction both with the care they receive and the quality of the provider-patient communication (Flocke, Miller, & Crabtree, 2002; Wanzer, Booth-Butterfield, & Gruber, 2004; Zandbelt, Smets, Oort, Godfried, & de Haes, 2004). Patient satisfaction has been empirically linked to such communicative factors as overall amount of talk during clinical consultations, the perception of “open” communication, the number of casual (non-health related) questions asked by the physician, patient/parent pre-exam expectations, and the level of trust within the provider-patient relationship (Dutta-Bergman, 2005; Howell-Koren & Tinsley, 1990). For example, one classic study found that parents who felt they could express their concerns and were heard by doctors during pediatric acute care visits were more satisfied and had higher rates of treatment adherence (Korsch, Gozzi, & Francis, 1968).

Overall, research findings suggest that if pediatric health care providers fail to develop strong relationships with parents, based upon an understanding of the patient/family, the provision of interpersonal support, trust, and some degree of patient/parent satisfaction, it will result in ineffective clinical communication. This will in turn lead to the adoption of fewer behavioral recommendations and ultimately poorer health outcomes. Testing these assumptions by assessing parent perceptions of the quality and value of their relationships with their pediatric health care providers is a critical step in determining to what extent provider-parent relationships influence child health. It was therefore expected that perceived relational value and support from the parent-provider relationship would be related to subsequent child health behaviors in a manner associated with a reduced risk of obesity.

H3: Parents’ perceptions of relational support from their pediatric health care providers at baseline (Time 1) should negatively predict child obesogenic behaviors and positively predict anti-obesogenic behaviors at Time 2.

Relationship duration. The reason for having a “regular” health care provider is, of course, to avoid having a series of zero-history interactions. Relationship duration is an important factor in patient, family, and relationship-centered care approaches, because it facilitates the development of provider-patient/parent relationships, which develop and mature over time. As patients, parents, and health care
providers get to know each other, the dynamics and nature of their relationship will change, either making communication more effective (and/or satisfactory) or causing the relationship to dissolve. Heneghan et al. (2004) found that parents believed that pediatricians with whom they had a longer relationship were more justified in making recommendations and were better able to communicate those recommendations than pediatricians they had known for a shorter time. The parents also reported being more willing to accept recommendations coming from a pediatrician they had known longer, because they felt they trusted the provider more.

The notion that provider-parent-child relationship duration could affect the enactment of health behaviors aligns with well-established behavioral change models, such as the transtheoretical model of health behavior change (TM). TM argues that behavior change occurs in stages, from pre-contemplation (no interest in changing the behavior), all the way through action and behavioral maintenance (Prochaska & DiClemente, 1983, 1998; Prochaska et al., 1994; Rhee et al., 2005). TM has been empirically examined regarding both parental readiness for change in families with OW/OB children (Rhee et al., 2005) and actual weight loss outcomes in adults (Johnson et al., 2008). Although the TM has received mixed support in empirical analyses, the assumption that time is a key facet in behavior change is valuable in the context of patient and family-centered care. Health care providers can facilitate patients’ movements through these stages, but they need to know where each patient already is in the process of behavioral change (and in the case of pediatric behavioral change, where the parents and family members are) before they can tailor communication content and strategies appropriately. This requires having contextualized knowledge of the child, parent(s), and family, including health status, current behaviors/lifestyle, personal values (potentially including needs and goals), cultural influences, and significant barriers to change.

This type of customized approach to communicating information is consistent with patient, family, and relationship-centered care practices. It is also an approach that cannot be wholly assessed and implemented within a single clinical visit (Krebs, 2005). It requires time not only to gain the necessary patient knowledge and assess readiness for behavioral change, but also to facilitate the patient’s
movement from their initial stage to those involving the adoption and enactment of healthy lifestyle behaviors. During well child visits, this type of approach can be utilized not only to help change behaviors already causing medical problems, but also to facilitate behavior change proactively in anticipation of future health consequences. In fact, child OW/OB provides a good example of concrete preventative behavioral changes that can be addressed in a clinical setting (e.g., increasing fruit and vegetable consumption, restricting screen time, getting enough sleep), where time is short in any single visit but where a series of recommendations can be conveyed and reinforced over time. These arguments lend themselves to the following hypothesis:

\[ H_4: \text{The duration of the provider-parent relationship will positively predict parental perceived provision of weight-related information, value of information received, and relational support (at both T1 and T2). These three aspects of patient and family-centered care should significantly mediate the relationship between duration and child obesogenic/anti-obesogenic behaviors.} \]

**Outcome Variables: Obesogenic/Anti-Obesogenic Behaviors and BMI**

The ultimate goal of pediatric recommendations for preventing and treating childhood OW/OB is, of course, getting and keeping a child’s BMI into what is considered to be the healthy range [between the 5\(^{th}\) and 84\(^{th}\) percentile (AMA, 2011; Barlow et al., 2007; Davis et al, 2007)]. The developers of these recommendations rely on the assumption that each obesogenic or anti-obesogenic behavior (i.e., each proximal outcome) will contribute in some way to achieving/maintaining a healthy weight (i.e., distal outcome). Researchers therefore need to measure not only behavioral health outcomes, but also child BMI, to effectively demonstrate the link between communicative practices and patient health (Cegala & Post, 2009; Cegala, Street, & Clinch, 2007; Epstein & Street, 2011). For instance, the American Academy of Pediatrics (AAP Committee on Hospital Care, 2003) recommended an increase in somatic outcomes-based research regarding family-centered care practices (e.g., effects of specific communicative behaviors). Unfortunately, little reliable research of this sort has been done, especially with regard to distal health outcomes, which can only be seen over time (Epstein, 2006). A full assessment of the
relationship between communication variables and both proximal and distal health outcomes must involve a test of the relationships between the proximal and distal outcomes to establish the proximal outcomes as risk factors for the distal outcomes. These outcome variables and their expected relationships are explicated below.

**Physical activity.** There is a large body of evidence (from both population-based and experimental studies) indicating a strong causal link between moderate to vigorous physical activity and lower levels of BMI in children, starting in the preschool years and extending through adulthood (e.g., Jago, Baranowski, Baranowski, Thompson, & Greaves, 2005; Nelson et al., 2006; Remmers et al., 2014; Sherry, 2005; te Velde et al., 2012; Vale, et al., 2013; Viner & Cole, 2005). However, in a large-scale longitudinal analysis including measures of genetic predisposition for obesity, Richmond et al. (2014) concluded that there is actually bi-directional causality between physical activity and BMI. In other words, children who are less active gain more weight, but children who weigh more also end up becoming less active. Regardless of the directionality, there is more than enough evidence to support the suggestion that there would be a significant negative relationship between child physical activity and BMI.

**Food consumption.** Researchers have studied the relationship between child diet and weight from a variety of perspectives, from the consumption of specific nutrient types (carbs, fat, protein) (Skinner, Bounds, Carruth, Morris, & Ziegler, 2004) to child food preferences (Pinhas-Hamiel, Bar-Zi, Boyko, Reichman & Lerner-Geva, 2008). The most common way to categorize food intake is either based upon the food’s energy density (measured as kcal/g) or by type of food consumed (e.g., snack foods, fruits and vegetables, meat, dairy). Looking at national NHANES data from 2-8-year-old children, Vernarelli, Mitchell, Hartman, and Rolls (2011) found an association between higher energy density intake and lower levels of fruit and vegetable consumption. They also found significant associations between lower fruit and vegetable consumption and increased consumption of fat and added sugars. Most studies manipulating or tracking child eating behaviors (e.g., via randomized clinical trials or interventions, or investigations of causal pathways using structural equation modeling) have been able to
identify factors that predict child fruit and vegetable and/or energy-dense food consumption, but have been unable to link that consumption to child BMI (e.g., Hendrie et al., 2011; Natale, Lopez-Mitnik, Uhlhorn, Asfour, & Messiah, 2014; Wang et al., 2013). In fact, the majority of studies and review articles have found the linkages between food consumption and weight in young children to be either tenuous or inconclusive (e.g., Field et al., 2004; Field, Gillman, Rosner, Rockett, & Colditz, 2003; Jago, et al., 2005; Sherry, 2005; te Velde et al., 2012).

Does this mean that dietary intake in early childhood is unrelated to weight gain, or that weight gain simply takes time and might not result from a steadily obesogenic diet for months or even years? With very energy-dense foods like sugar-sweetened beverages (SSBs), consumption in early childhood increases the odds of children becoming or staying overweight while those children are still in preschool (De Coen, De Bourdeaudjuy, Verbestel, Maes, & Vereecken, 2013; Malik, Pan, Willett, & Hu, 2013). DeBoer, Scharf, and Demmer (2013) used national longitudinal data from the Early Childhood Longitudinal Survey–Birth Cohort, (ECLS-B) to show that although SSB consumption did not predict BMI at age 2, it did significantly predict BMI at ages 4 and 5, so that with those who consumed greater amounts of SSBs had higher odds of being obese. An equivalent Canadian study demonstrated similar results for this age group (Dubois, Famer, Girard, & Peterson, 2006). Therefore, although it may take time for obesogenic dietary intake to drive BMI into OW/OB territory depending on the energy density of the foods consumed, it is reasonable to argue that obesogenic food consumption is a risk factor, and anti-obesogenic food consumption a protective factor, in the development of OW/OB as indicated by BMI.

**TV viewing.** As with physical activity and SSB consumption, there is now a substantial body of evidence documenting the correlation between hours of TV viewing and child overweight (Braithwaite, 2013; De Coen, et al., 2013; Dennison et al, 2002; O’Brien et al., 2007; Proctor et al., 2003; Reilly et al, 2005;). This research, which clearly shows that the more TV a child watches, the greater the likelihood that he/she will either gain weight or is already overweight, is summarized thoroughly in a systematic review by Cox, Skouteris, Rutherford, and Fuller-Tyszkiewicz (2012).
TV consumption is also negatively associated with physical activity in preschoolers (Zecevic et al., 2010). However, multiple studies have found that TV viewing and physical activity affect child BMI independently, with neither behavior functioning in a mediating role (Jago, et al., 2005; te Velde et al., 2012; Viner & Cole, 2005). Interestingly, there is some evidence that increased consumption of energy-dense foods might mediate the relationship between TV consumption and BMI in young children as children who are watch more TV may eat more while they are watching, or may make less healthy food choices based on what they have seen on commercial TV (Dubois et al., 2008; Epstein et al., 2008; Harrison & Liechty, 2012; Manios et al., 2009; Fuller-Tyszkiewicz, Skouteris, Hard, & Halse, 2012). This has led to calls for increased research on the nature of the relationship between dietary intake, TV viewing, and child adiposity (Cox, et al., 2012).

All three of these types of behaviors (physical activity, food consumption, and TV viewing) are covered in the recommendations for what pediatric health care providers are supposed to discuss with their patients/families during primary care visits (Barlow & the Expert Committee, 2007). Based on the literature summarized above, it is expected that television viewing will function along with obesogenic food consumption as an obesogenic behavior, and that exercise will function along with anti-obesogenic food consumption as an anti-obesogenic behavior.

**H₅:** At Time 2, reported child obesogenic behaviors (obesogenic food consumption and TV viewing) should positively predict child BMI, and reported anti-obesogenic behaviors (fruit and vegetable consumption and exercise) should negatively predict child BMI.

It is important to note that weight problems present themselves differently as young children age, and although the trajectory of weight-related behaviors may start when they are in early preschool, biometric evidence of this behavior may not appear for years. In other words, it should not be surprising to find only a weak relationship between weight-related behaviors and BMI among preschoolers. This would merely indicate that further longitudinal analysis might be needed to demonstrate how obesogenic and anti-obesogenic behaviors affect weight status over time.
Once the relationships between (1) communication variables and obesogenic and anti-obesogenic behaviors, and (2) the relationships between obesogenic and anti-obesogenic behaviors and BMI have been evaluated, the third set of relationships, between communication variables and BMI, can be evaluated. Following the rationale linking obesogenic and anti-obesogenic behaviors with increases and decreases in BMI respectively, it would be reasonable to expect that the communication variables would predict decreased child BMI over time. However, since the research summarized above suggests that environmental factors may take time to produce increases in BMI, a research question is advanced instead:

**RQ1**: Does parents’ perceived provision of weight-related information, value of information received, and relational support at baseline (Time 1) predict child BMI at Time 2? To what extent are these relationships mediated by child obesogenic and anti-obesogenic behaviors at Time 2?
Method

The overall analytic model (depicted in Figure 3) is designed to examine the extent to which parental perceptions of provider-parent communication (specifically pertaining to perceived relational and informational support) at Time 1 predicts obesogenic and anti-obesogenic behaviors and BMI at Time 2.

Procedure and Participants

The measures used in this analysis were developed as part of a longitudinal panel survey of parents involved in the STRONG Kids Program at the University of Illinois at Urbana-Champaign (Harrison et al., 2011). This panel survey was administered and completed by participating parents once a year for three years. The STRONG Kids survey targeted families of preschool-aged children (24-48 months of age at the start of the study) attending licensed daycare facilities across multiple communities in Central Illinois. Daycare centers in Central Illinois were targeted for participation using stratified random sampling to obtain a diverse set of participants and to provide enough data to allow for statistical analysis of demographics. Diversity of demographic characteristics within this sample was important because parent/child race and ethnicity, gender, socio-economic status, and parent education all have been associated with both rates of childhood OW/OB and provider-parent-child interactions (Cox et al., 2007; Fitzgibbon et al., 2000; Heneghan et al., 2004; Sonneville et al., 2009; Stivers & Majid, 2007). Only daycare centers with at least 24 eligible children (based on child age) were asked to enroll as a research site. Of the 33 daycare centers contacted in the first year of data collection, 30 agreed to participate.

All families with a child 24-48 months of age enrolled at least part-time in one of these daycare centers were eligible to participate. As part of the consent process, parents agreed to complete a questionnaire (either on paper or via web-based survey); have trained research associates weigh and measure their child; and be contacted again for participation one year later. As an incentive to participate, all families were provided a $50 gift card following each wave of data collection. In their recruitment packets, families were provided paper copies of the consent form as well as information on how to access the survey online. Parents who completed the paper copy of the consent form and returned it to the secure
dropbox at their daycare center were provided the paper survey and a reminder of how to access the online survey. Parent response rates for year 1 ranged from 60% to 90% across the 30 daycare centers.

All families who participated in the first year (Time 1) were approached 12 months later (Time 2) to participate again. Parents were contacted either via email (for those who provided an email address) or with paper recruitment materials at their child’s daycare center. Parents who had not provided an email address, and who voluntarily informed us that their child was attending a different participating daycare, were contacted at the new location.

Measures

BMI percentile. Child weight status was assessed using BMI-for-age percentiles, rather than raw BMI scores. Although BMI scores are mathematically easy to calculate, BMI percentiles are currently used as the benchmarks for determine whether a child is considered clinically overweight or obese, and are visually represented on the child growth charts used in pediatric settings. This is because child BMI naturally varies by age and sex. The use of standardized BMI percentiles accounts for normative growth patterns for a child’s sex and allows weight status to be compared as he or she ages (Voakes & Bremer, 2012).

In order to determine the BMI percentiles of participating children, undergraduate research associates visited each preschool or daycare center and weighed and measured each child after the completion of their parents’ surveys at Time 1 and Time 2 (with measurements taken as close to 12-month intervals as possible). Child heights and weights were measured with stadiometers and digital scales at their daycare center locations according to the World Health Organization (WHO) child measurement procedure for height and weight collection (World Health Organization, 2008). Each child’s exact age was calculated in months and weeks based on the child’s birthdate and the date of data collection. BMI scores and percentiles were then calculated using the CDC’s “Children’s BMI Group Calculator” spreadsheet (CDC, Children’s BMI Tool for Schools, 2011).
For those families who had moved to another participating daycare prior to the second data collection, children were weighed and measured at the new location. For those who filled out surveys online and were no longer enrolled in a participating daycare center, walk-in times were made available at public libraries (in multiple locations convenient to participants) and at the project’s research offices, where families could come and have their child’s measurements taken. Parents could also receive their gift card at that time.

**Provider-parent relationship.** There are a number of relevant self-administered patient rating scales that have demonstrated validity and reliability across different medical settings and health conditions. Two of these measures were adapted for use in this project. The first is the Health Care Climate Questionnaire (HCCQ), which assesses patients’ perceived autonomy in health care, consistent with self-determination theory (e.g., Williams, et al., 1998). The second is the Primary Care Assessment Survey (PCAS), which includes scales designed to measure communication, trust, interpersonal care, patient knowledge, organizational barriers, longitudinal continuity, visit-based continuity (how often patients get to see their primary care provider, or the same provider over time), and overall satisfaction (Ramsay, Campbell, Schroter, Green & Roland, 2000; Safran et al., 1998).

Given the parent sample and the hypotheses in question, items from the HCCQ and PCAS were adapted to apply to pediatric well-child visits (see the Appendix for all items). The most common change was the replacement of the phrase “my doctor” with “your child’s healthcare provider.” Before answering any of these questions, parents were given the following instructions: “We are interested in the kinds of things that you discuss with your child’s regular health care provider (e.g., pediatrician or nurse practitioner). Please answer the following questions as best you can based on past appointments you have had with your child’s regular doctor/nurse. If your child does not have a regular health care provider (or a group of regular health care providers), please indicate that in the first question, and then answer the rest based on the health care interactions you have had with all of your child’s health care providers in the past.” As the various PCAS scales had different ranges of scores and numbers of questions, all measures used were standardized with a transformation to a 1-100 scale, according to the scoring rubrics provided.
by the survey developers (unpublished, retrieved by personal communication, June 9, 2008). To make scores consistent within the category of relationship support, the HCCQ measure (autonomy support) was also re-scored in this manner (consistent with Franks et al., 2005).

**Autonomy support.** Autonomy support assesses the supportive nature of the clinical climate based on shared control (in participative decision making, perspective taking, clinical discussions, and so on) as a predictor of motivation and health behavior. To minimize participant fatigue, rather than using the longer 15-question version of the HCCQ (Williams, Ryan, & Deci, unpublished, validated $\alpha = .90$), the 6-question short-form was used (validated $\alpha = .82$; in this study $\alpha = .94$).

**Contextual knowledge of patient.** The scale measuring this construct, containing 4 items adapted from the PCAS, included questions regarding the provider’s knowledge of the patient’s medical history, parental values and beliefs, and the family/household context (validated $\alpha = .92$, Safran et al., 1998; in this study $\alpha = .90$).

**Interpersonal treatment.** This PCAS scale assesses the personal aspects of the care received during pediatric interactions. This 4-item scale includes the perceived amount of time spent with the patient/family during appointments, as well as perceived displays of patience, friendliness, caring, and concern (validated $\alpha = .95$, Safran et al., 1998; in this study $\alpha = .93$).

**Communication.** Much of the discourse and theorizing about PCC focuses on communication, both in terms of perceptions and behaviors. In this study, communication was operationalized as a quantifiable set of behaviors that occur during pediatric interactions, as is in the PCAS (6-item measure, validated $\alpha = .95$, Safran et al., 1998; in this study $\alpha = .94$). This particular conceptualization of communication encompasses the perceived thoroughness of questions asked by providers, the thoroughness of provider answers to patient questions, the extent to which providers advise upon and assist with decision making, and the quality of the provider’s explanations of health issues, treatment plans, and follow-up care.

**Trust.** There are a number of different measures available that measure trust in provider-patient contexts [see Pearson and Raeke (2000) for a side-by-side treatment of the three most common], many of
which are comparable in scope and reliability. For the sake of consistency, and based on the manageable number of questions involved, the 8-item trust subscale of the PCAS was used (validated $\alpha = .86$, Safran et al., 1998; in this study $\alpha = .83$).

**Overall satisfaction with the provider.** The PCAS measures satisfaction as a single-item variable (adapted as “All things considered, how satisfied are you with your child’s regular health care provider?” rated on a 7-point scale). However, based on Mead and Bower’s (2000) arguments, along with potential reliability issues, and based on email correspondence with the PCAS administrators, a second satisfaction item (also included in the PCAS: “Would you recommend this health care provider to your family and friends?” scored on a 5-point Likert-type scale) was added to create a 2-item scale ($r = .81$). This makes the assessment of overall satisfaction with the provider consistent with similar measures from other sources.

**Overall relational support (CISTAK).** Franks et al. (2005) demonstrated a connection between four of the scale measures described above: autonomy support (as measured by the HCCQ), trust, knowledge of the patient, and satisfaction (using the same subscales of the PCAS used in the present study). In their analysis, all four variables loaded at similar levels onto to a single factor (.83-.86), thereby providing a more global assessment of the interpersonal aspects of the provider-patient relationship. This composite “STAK” score (Satisfaction/Trust/Autonomy/Knowledge) demonstrated a Cronbach’s $\alpha = .88$ in the Franks et al. study. When aggregated in the same way (averaging the four scale scores), the STAK variable score in this data set demonstrated $\alpha = .85$.

As all possible correlations between the HCCQ and all 5 subscales of the PCAS at Time 1 and Time 2 were significant at the $p < .01$ level (ranging from $r = .43$ to $r = .89$; see Table 2), additional composite scales were tested for their reliability. In the end, the mean-aggregated six-construct scale (combining the 4 STAK components, plus the Communication and Interpersonal scales of the PCAS) demonstrated the highest degree of internal consistency at both Time 1 and Time 2 ($\alpha = .91$ at each time). This new scale, dubbed CISTAK, was used in all regression analyses as the measure of parent-perceived relational support from their child’s primary health care provider.
Perceived provision of weight-related information. Questions assessing parental perceptions of the provision of weight-related recommendations during well child-visits (based on recommendations for what pediatric health care providers should tell their patients/families about OW/OB behaviors; see earlier discussion, e.g., Barlow and the Expert Committee, 2007; Davis et al., 2007) were developed specifically for use in this survey. Parents were asked to indicate (by checking a box) whether or not their child’s healthcare provider had made specific food, exercise, or media-related recommendations for behaviors they (the parents) should do for their children, and also behaviors that their children should do themselves. The exact prompts and questions can be found in the Appendix.

Each of these specific recommendations was subsequently treated as a dichotomous variable (0/1): either perceived by the parent as having been communicated by the health care provider or not. Items within each category of behavior (food consumption, physical activity, and TV viewing) were totaled, resulting in a score for each of the three recommendation domains. Scores for food/nutrition could range from 0 to 9 (as there were 9 recommendations covering these topics), and scores for TV viewing could range from 0 to 2 (as there were 2 recommendations about TV). As there was only one physical activity recommendation, scores in this domain could be only 0 or 1. For each domain, a higher score indicates a greater number of recommendations made.

In addition to these scores, one additional item assessed the information provided to parents related to the potential effects of not engaging in recommended behaviors: “How often does your child’s healthcare provider discuss the risks and consequences of being overweight (e.g., hypertension, high cholesterol, sleep problems)?” Responses were measured on a 5-point scale (never, occasionally, about half the time, most of the time, and every visit).

Perceived informational value. Perceived value of information was operationalized in three components: (1) satisfaction with the quantity of information received from a provider; (2) satisfaction with the quality of information received from a provider; and (3) the potential impact of this information on the perceiver’s decision-making and behavior. Each question was asked in the form of a 5-point Likert-type scale with a not-applicable (NA) option, and was specific to information related to childhood
OW/OB. Three questions (satisfaction with the quantity of information, satisfaction with the quality of information, and influence of that information on topical decision-making behaviors) were asked regarding food and nutrition, and another three asked regarding the child’s TV viewing behaviors.

One additional question was asked as a more global assessment of how much “these discussions with your child’s healthcare provider influence the decisions you make for your household (e.g., what to feed your child, how to structure his or her physical activities, the amount of TV that your child watches).” This was also framed as a five-point scale (1 = doesn’t influence my decision at all, 3 = influences my decisions somewhat, 5 = influences my decisions a lot), along with an NA option.

**Relationship duration.** Longitudinal continuity, as measured in the PCAS, assesses the duration of the provider/patient relationship. The question was worded as “How long has this person been your child’s regular health care provider,” with response options of less than 6 months, between 6 months and 1 year, 1-2 years, 3-4 years, 4-5 years, and more than 5 years.

**Obesogenic and anti-obesogenic behaviors.** Recommended anti-obesogenic behaviors (based on AMA and AAP guidelines, e.g., Barlow & the Expert Committee, 2007) include getting the recommended daily servings of fruits and vegetables, eating a diet high in fiber, and getting 60 minutes of physical activity every day. AMA and AAP recommendations regarding obesogenic behaviors include limiting the consumption of sugar-sweetened beverages and energy-dense (high-calorie) foods, limiting the number of meals eaten at restaurants (especially fast food outlets), and restricting media use/screen time to less than two hours per day. The Appendix contains the survey items used to assess parent-reported frequency of obesogenic and anti-obesogenic behaviors, based upon the recommendations from these sources. These fall into three categories: food consumption (obesogenic and anti-obesogenic), physical activity and TV viewing.

**Food consumption.** Food intake questions were adapted from the federal Early Childhood Longitudinal Survey—Birth Cohort (ECLS-B) parent interview (U.S. Department of Education, National Center for Education Statistics, 2005). In this project, anti-obesogenic foods included the number of (parent-reported) times a child consumed fruits and vegetables during the previous 7-day period.
Obesogenic foods included sugar-sweetened beverages, salty snacks, French fries, sweets, and fast food. Each question was worded with the same prompt: “How many times did your child eat…” followed by the category of food, specific examples, and additional descriptions for clarity. Parents could choose from the following 8 options: one to three times during the past 7 days, four to six times during the past seven days, once a day, twice a day, three times a day, four or more times a day, my child did not eat/drink any (food category) in the past 7 days, and don’t know. These categorical responses were transformed into numerical count data, representing the number of times per day the type of food/beverage was consumed, consistent with the scoring method employed by Harrison and Liechty (2012). For each of the types of food measured, scores could range from 0 (indicating no consumption of that food item) to 4 (indicating that four servings of that items were consumed per day, during the prior week).

Daily fruit consumption was positively correlated with vegetable consumption at Time 1, $r = .376$ ($p < .000$). At Time 1, fruit was consumed an average of 1.68 times a day ($SD = 0.91$), and vegetables were consumed an average of 1.41 times a day ($SD = 0.82$). As many of the recommendations health care professionals are asked to give their pediatric patients combine fruit and vegetable consumption together as part of their suggestions for healthy eating, these two measures were added to create one measure of anti-obesogenic food consumption. As a result, scores for the combined category of anti-obesogenic food consumption could range from 0 to 8.

All five elements of obesogenic food consumption significantly correlated with each other at Time 1 ($p < .05$), except for sugar-sweetened beverages and fast food, which had a marginally significant correlation ($p = .052$). The most highly correlated foods were salty snacks (e.g., chips) and sweets, for which $r = .515$ ($p < .000$). These were also the most frequently consumed obesogenic foods at Time 1, with sweets being consumed an average of 0.69 times a day ($SD = 0.71$), and salty snacks 0.50 times a day ($SD = 0.29$).

Fast food was the least frequently reported obesogenic variable from this list (at Time 1), consumed only an average of 0.24 times a day ($SD = 0.29$). The vast majority (95.6%) of parents reported
that their child ate either no fast food or only ate it 1-3 times in the prior 7-day period. As the frequency of this variable was so low, it was not included in the aggregated measure. Therefore, reported amounts of sweets, french fries, salty snacks, and sugar-sweetened beverages were added to create a combined measure of daily obesogenic food consumption. Scores for the combined category of obesogenic food consumption, therefore, could range from 0 to 16.

Physical activity. Physical activity questions were adapted from the SPARK parent survey (Sallis, 1993) and the 2007 National Survey of Children’s Health (CDC, State and Local Area Integrated Telephone Survey, 2008). The root question was phrased “We’re interested in how much time your child spends doing these activities on an average WEEKDAY. About how many minutes does your child spend… (circle the best answer for each type of activity)” [bold included in survey text]. Choices were 0 minutes, 15 minutes, 30 minutes, 45 minutes, and 60+ minutes for each of the following four types of activities: indoor active playing, indoor quiet playing, outdoor active playing, and outdoor quiet playing. The same root question was then asked regarding “an average WEEKEND DAY,” with the same categories and response set.

A daily average for indoor active play was created by multiplying the reported weekday total by 5 and the weekend day total by 2, adding the two scores together, and dividing by 7. The same was done to create a daily average for outdoor active play. These two scores (indoor and outdoor) were added together to create an overall score for average daily minutes of physical activity. Possible scores for this measure ranged from 0 to 120 minutes.

TV viewing. Television exposure questions modeled those used in the Kaiser Family Foundation studies on American children’s and adolescents’ media use (e.g., Rideout, Vanderwater, & Wartella, 2003; Roberts, Foehr, Rideout, & Brodie, 1999). In a manner similar to that described for the calculation of daily physical activity, and consistent with TV exposure measurements used in Harrison (2000) and Harrison and Liechty (2012), parents were asked to report how many minutes their child watched TV during four different parts of their day (in the morning before daycare, during daycare, after daycare before dinner, and after dinner before bed) on a typical weekday and a typical weekend day. Response
options that parents could choose for each of the four parts of the day were 0 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 3 hours, 4 hours, and 5+ hours. Parents were also given the option of circling “DK” (don’t know). Hours were recoded to minutes and reported minutes of TV viewing were totaled across the day parts to create total weekday and total weekend day scores. Total weekday scores were multiplied by 5, and total weekend day scores were multiplied by two. These were then added together to create a score representing the amount of TV the child viewed per week. Therefore, the possible range of scores reporting weekly child TV viewing ranged from 0 to 7800 minutes.

**Demographic variables.** In order to isolate the amount of variance contributed by the independent variables of interest, all regression analyses included covariates shown in research to be correlated with either pediatric communication or the risk of childhood OW/OB. These parent-reported variables include: parent gender (Cox et al., 2007; Cox, Smith, Brown, & Fitzpatrick, 2009; Levi et al., 2013; Stivers & Majid, 2007), parent education (Cox & Raam, 2008; Cox, Smith, & Brown, 2007; Fitzpatrick, Brown, Smith, & Cox, 2009; Levi et al., 2013; Stivers & Majid, 2007; Strauss & Knight, 1999; Street, 1992), parent BMI (Hernandez et al., 2010; Martin & Ferris, 2007; Melgar-Quiñonez & Kaiser, 2004; Wrotniak, Epstein, Paluch, & Roemmich, 2004), parent race/ethnicity (Cooper, 2003; Flores, Olson, & Tomany-Korman, 2005; Heneghan et al., 2004; Stivers & Majid, 2007), child race/ethnicity (CDC, 2001a; Edmunds et al., 2006; Flores et al., 2005; Ogden & Carroll, 2010; Stivers & Majid, 2007), household income (CDC, 2001a; Dumont-Mathieu et al., 2006; Heneghan et al., 2004; Levi et al., 2013; Melgar-Quiñonez & Kaiser, 2004), child age (Cox et al., 2009; DeCivita & Dobkin, 2004; DiMatteo, 2004; Small, Anderson, Sidera-Arcoleo, & Gance-Cleveland, 2008; Tates et al., 2002), and child gender (Cox et al., 2007, Cox et al., 2009; Martin & Ferris, 2007). The exact wording of all questions can be found in the Appendix. Finally, as this project involved predictions of Time 2 versions of measures taken at both Time 1 and Time 2, regression analyses predicting Time 2 measures controlled the Time 1 value of the relevant measure.
Results

Descriptive Statistics

Table 1 reports the means, standard deviations, and intercorrelations for all variables included in analyses. These include demographic control variables (all from Time 1), constructed scales measuring predictor variables (Time 1), obesogenic and anti-obesogenic behaviors (Time 1 and Time 2), and child BMI percentile (Time 1 and Time 2). At Time 1, 89.7% of participating parents were female ($n = 444$). For parents who provided information about their race, 67.9% ($n = 320$) self-identified as White/Non-Hispanic, while 32.2% ($n = 152$) identified as either Hispanic or non-Caucasian. In terms of parent education, 11.1% had a high school education or less, 32.1% had some college or a technical college degree, 26.3% were college graduates, and 27.9% had completed at least some post-graduate work. Almost 31% ($n = 141$) reported a household income of $24,999 or less. The median length of time families reported seeing the child’s primary health care provider was between 1-2 years at Time 1 and 3-4 years at Time 2.

The average self-reported parent BMI at Time 1 was 27.35 ($SD = 6.50, n = 468$). Based upon current CDC measurement standards, 26.9% of parents qualified as overweight (BMI between 25.0 and 29.9) and 27.1% qualified as obese (BMI = 30.0 and above). All children at Time 1 were either 2 or 3 years of age and more than half (51.1%) were male ($n = 254$). According to CDC standards, at Time 1 15.5% of children were overweight (BMI between the 85th and 95th percentile) and 7.6% were obese (BMI equal to or greater than the 95th percentile). At Time 2, 17.8% of children were overweight and 9.6% were obese.

Overall, children in this study consumed more servings of anti-obesogenic than obesogenic foods on a daily basis, by roughly a 2:1 ratio. Parents reported an average child’s consumption of 1.40/1.36 (Time 1/Time 2) servings of vegetables and 1.68/1.66 (Time 1/Time 2) servings of fruit per day. Children also reportedly ate an average of 0.69/0.64 (Time 1/Time 2) servings of sweets/candy, 0.50/0.39 (Time 1/Time 2) servings of salty snacks, 0.31/0.24 (Time 1/Time 2) servings of French fries (or other fried potatoes), and 0.45/0.24 (Time 1/Time 2) servings of sugar sweetened beverages. In terms of physical
activity, 90.0% of parents at Time 1 and 91.2% at Time 2 reported that their child engaged in at least the recommended 60 minutes of physical activity per day. In terms of TV viewing, 27.1% of children at Time 1 and 22.3% of children at Time 2 were exposed to more than the American Academy of Pediatrics’ recommended limit of 120 minutes/day (840 minutes/week).

Out of a maximum of 10 food/nutrition-related recommendations (from the previously discussed AAP recommendations for what pediatric providers should communicate to families), parents reported that their child’s health care provider made an average of 3.07 (SD = 2.84) recommendations. At Time 1, more than a quarter (26.8%) of parents said that they were not given any of these recommendations and only 3.2% said that they were given all 10. The AAP’s singular recommendation for physical activity in this age group was reportedly given to only a third of families (34.0%) at Time 1. The AAP’s recommendations to limit children’s screen time to no more than 2 hours a day and to remove televisions from children’s bedrooms were both given to parents 7.2% of the time at Time 1. More than three-quarters of parents (76.7%) reported that they received neither TV-related recommendation. The remaining 16.1% reported receiving only one of the two recommendations.

**Intercorrelations**

As depicted in Table 1, child BMI percentile was significantly associated with two parent characteristics, BMI and education. Reports of obesogenic and anti-obesogenic behaviors appeared relatively stable, and all Time 1 measures positively correlated with their Time 2 counterparts. Combined fruit and vegetable consumption negatively correlated with TV viewing both at Time 1 and Time 2. TV viewing positively correlated with child BMI percentile at Time 2, as well as obesogenic food consumption (combined sweets, fries, soda, and chips) at both time points. Obesogenic food consumption, TV viewing, and physical activity were each significantly associated with many demographic variables (e.g., parent education, self-identified race and/or ethnicity, household income, and parent BMI), justifying the decision to control them during hypotheses testing.

As expected, higher reported levels of relational support (CISTAK) correlated with longer duration of the parent-provider relationship. Relational support also positively correlated with both
obesogenic food consumption and physical activity, but not with any of the parent/child demographics or BMI. Significant positive correlations were present for the vast majority of the information provision and informational value measures.

**Initial Regression Analyses**

Given the variety and quantity of items comprising the communication variables, and the positive correlations between information provision and value measures, exploratory regression analyses were performed to determine which items could be dropped from each key communication predictor prior to hypothesis testing. This was done to render the final omnibus regression analyses (entering all communication predictors simultaneously) for each criterion variable more parsimonious and avoid using degrees of freedom without justification. Accordingly, separate multivariate regression analyses were run for relational support (CISTAK); information provision (number of domain-specific recommendations, discussion of the risks/consequences of OW/OB); and informational value (satisfaction with information quality, satisfaction with information quantity, influence of domain-specific advice on child behavior, influence on weight-related decision making for the household) as predictors. Whenever possible, domain-specific versions of variables (those specific to the content area: food/nutrition, physical activity, or TV viewing) were used in analyses predicting criterion variables specific to the same domains, allowing for greater conceptual clarity and explanatory power.

In each of the individual multivariate regressions, the first step contained covariates (parent and child demographics, Time 1 measure of each criterion variable). The relationship duration measure was entered on the second step, in order to isolate the potential influence of time on the other communication and relationship variables. The final step contained the relational or informational support variables being used to predict each of the five separate criterion variables: anti-obesogenic food consumption, obesogenic food consumption, physical activity, TV viewing behavior, and child BMI percentile. Because child BMI percentile likely has multiple overlapping etiologies, some of which are represented here, these particular predictive models included cross-domain aggregates, rather than domain-specific measures. Specifically, these models included “total number of weight-related recommendations given” (an additive
aggregate), as well as mean aggregates for “satisfaction with information quality” and “satisfaction with information quantity.” The global question of how much weight-related discussions “influence the decisions you make for your household” was also used instead of the domain-specific influence questions. Collectively, these choices kept the number of degrees of freedom consistent across models and helped minimize possible multicollinearity issues. Results of these multivariate regressions are summarized in Tables 3, 4, and 5.

Hierarchical regressions were also performed to test hypotheses predicting relationship duration based on perceived relational and informational support variables, and for predicting child BMI percentile based on parent-reported obesogenic and anti-obesogenic behaviors at Time 2. These models utilized the same demographic covariates previously described.

**Information provision.** Table 3 shows the results of hierarchical regression analyses predicting each of the five criterion variables from parent-reported information provision. The model predicting anti-obesogenic food consumption was nonsignificant. However, information provision significantly predicted physical activity, \(F(2, 257) = 4.70, p \leq .01\). Looking at specific predictive factors, only the perceived number of recommendations about exercise and activity provided at Time 1 positively predicted reported physical activity levels at Time 2, \(\beta = .12, t(256) = 2.18, p < .05\). Thus the anti-obesogenic behavior predictions in \(H_1\) are partially supported.

Models of information provision predicting obesogenic food consumption and TV viewing were both significant at the \(p < .05\) level. Time 1 discussions of the risks and consequences of being overweight negatively predicted obesogenic food consumption at Time 2, \(\beta = -.09, t(237) = -2.07, p < .05\). In contrast, the overall number of recommendations made about eating these unhealthy foods at Time 1 positively predicted their consumption at Time 2, \(\beta = .10, t(237) = 2.37, p < .05\). Conversely, TV viewing at Time 2 was negatively predicted by the overall number of recommendations made about TV viewing at Time 1, \(\beta = -.11, t(261) = -2.20, p < .05\). Therefore, based upon issues of directionality and significance, only portions of the obesogenic behavior predictions in \(H_1\) are supported.
**Informational value.** Table 4 shows the results of hierarchical regression analyses predicting each of the criterion variables based on perceived informational value. In terms of anti-obesogenic behaviors, informational value failed to predict any facet of anti-obesogenic food consumption. Although the model predicting child physical activity was itself nonsignificant, the informational satisfaction variables had some significant relationships. Assessments of satisfaction with information quantity and quality were related to child physical activity in opposite directions, with quality predicting activity in a positive direction, $\beta = .26$, $t(190) = 2.29$, $p < .05$, and quantity nonsignificantly related in a negative direction, $\beta = -.20$, $t(190) = -1.76$, $p \leq .10$. The perceived influence of the information was not a significant predictor.

TV viewing behavior at Time 2 was significantly predicted by parents’ reported influence of TV viewing-specific information at Time 1, $\beta = -.13$, $t(182) = -2.15$, $p < .05$. The individual multivariate model for informational value predicting obesogenic eating behaviors was not significant—and within it, only information usefulness achieved marginal significance, $\beta = .08$, $t(197) = 1.74$, $p \leq .10$. Overall, these results demonstrate mixed support for $H_2$. There is some evidence that satisfaction with information quantity does not function in the same way as satisfaction with information quality, with quality-related satisfaction demonstrating the hypothesized relationship (positive for anti-obesogenic behaviors and negative for obesogenic behaviors) and quantity-related satisfaction demonstrating the opposite relationship pattern (negative for anti-obesogenic behaviors and positive for obesogenic behaviors). The second source of mixed support is the lack of consistent relationships for the usefulness of information across behaviors. This variable demonstrated the hypothesized relationship in the context of TV viewing, but the opposite relationship in the context of obesogenic food consumption. No significant relationship was found for either anti-obesogenic behavior.

**Relational support.** The relationship between relational support (CISTAK) at Time 1 and anti-obesogenic food consumption at Time 2 (shown in Table 5) was nonsignificant. This was also the case for reported measures of Time 2 child physical activity. There were, however, significant relationships between relational support and obesogenic behaviors. Perceived relational support at Time 1 positively
predicted the eating of obesogenic foods at Time 2, $F(1, 239) = 6.64, p \leq .01$. This runs contrary to the hypothesized directionality of the model, as it was expected that relational support would predict lower obesogenic food consumption by children one year later. The individual model yielded no significant relationship between the variables in the model for TV viewing. In summary, these results do not support either portion of $H_3$. They do, however, indicate the possibility of a significant relationship between relational support and obesogenic food intake, but in an unexpected direction.

**Relationship duration.** The fourth hypothesis predicted that provider-parent relationship duration would positively predict perceived relationship quality, the provision of weight-related information, and the value of information received. Linear regression analyses revealed that Time 1 relationship duration significantly predicted perceived relational support (CISTAK) in a positive direction, $F(1, 421) = 4.25, p < .05$. Relationship duration did not significantly predict any of the other informational support variables (provision or value).

At Time 2, relationship duration again positively predicted perceived relational support, $F(1, 259) = 14.89, p \leq .001$. It also significantly predicted four of the informational value variables: satisfaction with the quality of information provided about food and nutrition, $F(1, 245) = 4.39, p < .05$, satisfaction with the quantity of information provided about TV viewing, $F(1, 192) = 4.97, p < .05$, satisfaction with the quality of information provided about TV viewing, $F(1, 191) = 6.76, p < .01$, and perceived influence of TV-related advice on child TV viewing behavior, $F(1, 167) = 5.89, p < .05$. It also marginally predicted satisfaction with the quantity of information provided about food and nutrition, $F(1, 249) = 3.59, p < .10$. All coefficients were positive. At neither time did relationship duration significantly predict the provision of information, regardless of weight-related topic. Based on these results, hypothesis $H_4$ was supported only for relational support (i.e., the longer the parent-provider relationship, the higher the perceived level of relational support) and perceived informational value for the TV viewing domain.

Although the duration of the parent-provider relationship predicted some elements of relational and informational support, it did not significantly predict any of the obesogenic or anti-obesogenic behaviors in the multivariate regression models (see Tables 3, 4, and 5). Based on the lack of findings for
relationship duration in these three models, duration was dropped from the omnibus regression model (Table 6).

**Predictors of child BMI percentile.** It was also hypothesized that predictive relationships would exist between the parent-reported obesogenic and anti-obesogenic behaviors (at Time 1) and child BMI percentile (at Time 2). When entered together in a regression model predicting Time 2 child BMI percentile and controlling demographic factors and Time 1 child BMI percentile, neither the individual behaviors nor the model were significant. This was also the case in regression analyses for each behavior separately (not controlling the other behaviors). Thus H$_5$ was not supported.

That is not to say that there were no significant predictors of child BMI percentile at Time 2 in these analyses. The overarching research question (RQ$_1$) asked if the perceived communicative facets of the provider-patient interaction (either informational or relational) would directly predict child BMI percentile. When informational and relational support were examined separately in regression models, relational support significantly predicted Time 2 child BMI percentile in a positive direction, $F(2, 223) = 5.64, p < .05$. Within the information provision model, providers discussing the risks and consequences of OW/OB positively predicted child BMI percentile, $\beta = .09, t(221) = 1.93, p \leq .05$. In the informational value model, only the perceived influence of parent-provider discussions of obesogenic topics on parents’ weight-related household decision making significantly predicted child BMI percentile, in a *negative* direction, $\beta = -.11, t(184) = -2.25, p < .05$.

**Omnibus Predictive Model**

Table 6 shows the results of the omnibus regression analyses predicting each of the five criterion variables. Predictive variables with a $p$-value of $\leq .10$ for any of the criterion variables in the analyses summarized above were included in the final omnibus model. By this conservative decision rule, all of the elements of information provision, informational value, and relational support were retained. Only the measure of relationship duration was dropped. The purpose of the omnibus regression model was to set the communication variables against each other to see which emerged as the most meaningful predictors. The omnibus model contained two steps, one with all covariates, and one with all communication...
variables except duration. Five versions of the omnibus model were run, one for each of the criterion variables. The results of the omnibus regression analysis are depicted in Table 6.

Information provision. Controlling the other communication variables, the frequency of Time 1 discussions of the risks and consequences of being overweight positively predicted Time 2 TV viewing behavior, $\beta = .14, t(180) = 2.23, p < .05$, and negatively predicted Time 2 obesogenic food consumption, $\beta = -.11, t(195) = 2.28, p < .05$. The other facet of information provision, number of domain-specific recommendations, was no longer significant in the omnibus models.

Informational value. In the omnibus model predicting physical activity, levels of satisfaction with perceived information quantity and quality were again significant. Satisfaction with quality at Time 1 predicted higher levels of child physical activity at Time 2, $\beta = .24, t(188) = 2.12, p < .05$, whereas satisfaction with quantity at Time 1 predicted lower levels of child physical activity at Time 2, $\beta = -.23, t(188) = -2.01, p < .05$. The perceived influence of the information did not play a significant role in either version of the model. As was the case in the individual multivariate model, informational value failed to predict anti-obesogenic food consumption. Further, TV viewing behavior at Time 2 was significantly predicted by influence of TV viewing-specific information at Time 1, $\beta = -.16, t(180) = -2.60, p < .01$. The greater the reported influence of the information provided by the healthcare provider, the lower the reported child TV viewing one year later.

Relational support. Neither the individual multivariate nor omnibus models indicated a significant relationship between relational support (CISTAK) at Time 1 and anti-obesogenic food consumption at Time 2. This was also the case for reported measures of Time 2 child physical activity. These results do not support the portion of $H_3$ that predicted anti-obesogenic behaviors. In addition, perceived relational support at Time 1 positively predicted the eating of obesogenic foods at Time 2, $\beta = .10, t(195) = 1.97, p \leq .05$. This runs contrary to the hypothesized directionality of the model, as higher reported levels of relational support were expected to predict lower obesogenic food consumption by children one year later. Although there was no support for $H_3$ as predicted, there may still be a significant predictive relationship between the constructs in an unanticipated direction.
**Child BMI percentile.** In the omnibus predictive model for child BMI percentile, \( F(6, 183) = 4.06, p \leq .001 \), the same three factors significant in the individual models remained significant with the same directionality: \( \beta = .15, t(182) = 2.90, p < .01 \) for relational support, \( \beta = .15, t(182) = 2.96, p < .01 \) for discussing risks and consequences of OW/OB, and \( \beta = -.18, t(182) = -3.63, p < .001 \) for informational usefulness in weight-related decision making. Higher levels of perceived relational support from pediatric health care providers and greater frequency of discussions about risks and consequences when children were 2-3 years old continued to predict higher child BMI percentile one year later. In contrast, when parents at Time 1 reported that weight-related discussions with their providers were useful in their decision-making, their children had lower BMI percentiles at Time 2. Overall, these communicative factors accounted for 4.4% of the variance in child BMI percentile at Time 2. Demographic variables and child BMI percentile at Time 1 accounted for 62.6%.

Regarding the predicted potential mediation effects hypothesized in \( H_4 \), even though there is evidence that some relational and informational factors predict child BMI percentile at Time 2, with no significant relationship between Time 2 obesogenic/anti-obesogenic behaviors and child BMI percentile (see aforementioned tests of \( H_6 \)), there can be no demonstration of mediation.
Discussion

A pictorial representation of the significant results from the omnibus model is represented in Figure 4. This figure also includes the significant results from the test of $H_5$, depicting the direct relationships between relationship duration and the other informational and relational variables. The results of this study call attention to four overarching sets of findings.

First, each of the five criterion variables was predicted by a different pattern of communicative factors. As represented in Figure 4, children’s daily intake of obesogenic foods (including sweets, chips/salty snacks, sugar-sweetened beverages, and french fries) increased more in families who believed they received higher levels of relational support from their pediatric health care provider, and significantly decreased for those who reported having more frequent discussions with their provider about the risks and consequences of being overweight. Average daily minutes of physical activity increased significantly when parents reported they were more satisfied with the quality of information they received from their provider, but decreased when parents reported they were more satisfied with the quantity of the information they received. Children were likely to watch more minutes of TV per day when their health care providers talked to the family about the risks and consequences of being overweight. Children tended to watch fewer minutes of TV when parents believed the TV-related advice they got from their providers had more of an influence on their behavior and decision-making (controlling for the amount of TV-related information received). Changes in daily fruit and vegetable consumption were not significantly predicted by any of the features of family-centered care included in the omnibus model. Finally, child BMI percentile significantly decreased when parents felt the weight-related advice they received from their provider had more of an influence on the decisions they made for their household. Interestingly, child BMI percentile increased more when families reported higher levels of relational support from their provider and had more frequent discussions about the risks and consequences of being overweight during their well-child visits.

Because these predictive patterns are so different, one cannot assume that the same approach works to facilitate behavior change (or treatment adherence) for each of the types of behaviors that
contribute to child weight. One cannot even generalize on the basis of whether the behaviors are obesogenic or anti-obesogenic, or on the basis of whether they relate to food/nutritional intake or some other type of activity. Thus, making cross-domain recommendations for how to communicate about these behaviors in clinic is not likely a useful approach.

Second, information provision does not appear to be the most important feature of clinical communication in the context of early childhood obesity, at least not in terms of effectiveness at predicting weight-related behavioral health outcomes. Although the mere provision of recommendations (specifically pertaining to physical activity and TV viewing) was a significant predictor in the preliminary regression analyses, once the perceived value of that information and the relational context of the interaction were taken into account in the omnibus models, relationships for information provision became nonsignificant. This indicates that providing families with weight-related informational support requires doing more than simply listing off recommendations. That information has to be communicated in a manner and context that makes it useful and relevant for parents, so that parents feel the information is valuable to them in their decision-making and behavioral patterns.

Third, the parents in this study judged the quantity and quality of the information they received independently, with the two satisfaction ratings predicting criterion variables in opposite directions. Satisfaction with the quality of the information provided was a better predictor of anti-obesogenic behavioral change than satisfaction with information quantity, which, when it was a significant predictor, actually predicted an increase in undesirable behaviors. This distinction between quantity and quality provides an interesting way of separating out parents’ feelings about how much information they like to receive, and how the delivery and content of that information might have made it useful to them.

Fourth, having a “good” parent-provider relationship (based on parental perceptions of communication, interpersonal treatment, satisfaction with care, trust, autonomy support, and knowledge of the patient/parent) does not necessarily predict positive health outcomes for the child. In fact, with the present sample it functioned as a risk factor, even controlling for the amount of relevant information provided and the extent to which parents valued that information. There were no instances where higher
ratings of relational support predicted weight-related outcomes in the anticipated (beneficial) direction. This raises some interesting challenges to some of the central tenets of patient and family-centered care, and again raises the question of whether focusing on giving parents what they want from these interactions actually inhibits providers from giving parents what they need. This discussion will examine potential explanations for these findings, as well as implications for both research and clinical practice.

**Informational Support**

The first hypothesis was that the mere provision of weight-related information was enough to significantly predict obesogenic and anti-obesogenic behaviors one year later. This was operationalized as the number of specific recommendations given during well-child visits, as well as the frequency of information provided about the risks and consequences of being overweight (which has been shown to influence parental willingness to engage in weight-related behavior change; Rhee et al., 2005). Although the number of behavioral recommendations was a significant factor in the information-specific models predicting physical activity and TV viewing (in the anticipated direction) and obesogenic food consumption (in a counterintuitive direction), when entered into the omnibus model (along with information value and relational support) information provision lost its predictive value.

Why, once other informational and relational variables are taken into account, does the perceived provision of recommendations no longer appear to matter? Part of the problem may be in the distribution of the number of recommendations provided to the participants in this sample. The median number of weight-related recommendations given across content areas was three (at both Time 1 and Time 2), out of a possible maximum of 13 AAP-suggested recommendations. More than 25% of the parents in this study \( n = 127 \) did not receive any weight-related recommendations from their providers at Time 1, a number that only decreased by 2.5% a year later. Only 2.2% of parents \( n = 11 \) at Time 1 reported receiving all 13. It is possible that if more parents were to have received a larger number of the behavioral recommendations, they might have predicted the outcome variables differently. There may be some kind of informational tipping point at which parents feel they have enough information to facilitate a behavioral change, or there may be a point at which the amount of information provided helps the overall
issue of weight management become cognitively salient, allowing parents to process the information in a more useful way or integrate it into their behavioral schemas. Either way, the positively skewed distribution, with relation to the number of recommendations perceived, may be a factor in why information provision is not a significant predictor in the omnibus model.

Another issue may be that the recommendations providers are urged to share with patients are not specific enough to be useful, either to providers or to parents. In order to make effective use of these recommendations, practitioners might want to know on a case-by-case basis what motivates parents or children to change their behavior, what their treatment preferences are, and what is preventing them from managing their health/weight more effectively. Without knowing more about the patient’s and family’s needs and desires, it could be difficult for a pediatric provider to tailor the information appropriately. Care must be given to the construction, timing, and content of these messages, along with their meaning and relevance for the specific family in question.

The need to appropriately time message delivery is addressed in the transtheoretical model of health behavior change (Prochaska & DiClemente, 1983, 1998; Prochaska et al., 1994; Rhee et al., 2005). Individuals are poised differently to accept health messages based on where they fall along the five stage-process of behavioral change. Depending on when parents might be with respect to their own weight-related behaviors, or perhaps what they might have already experienced with other children in the family, they may be at a point where they are more willing to take behavioral recommendations and use them. Understanding where parents are in this process can help providers choose which and how many recommendations to give, and also to put the recommendations into context for the family, thus making the communication more family-centered, and potentially more helpful.

We can also think about the effective tailoring of information provision in terms of Tyler and Horner’s (2008) Collaborative Negotiation Model (Figure 2). Based on this perspective, pediatric providers have to structure information delivery and collaborative strategies in light of the contextual features of the child and family. Specific to the topic at hand, providers would have to frame information differently based on contextual factors like family history of OW/OB (in terms of genetics and/or the
family environment), parent/child knowledge about obesogenic and anti-obesogenic behaviors, prior family experience with these behaviors, and parent/child attitudes about weight and weight-related topics (including cultural and social influences on values and behaviors).

Another information-related finding from this study was that the discussion of the risks and consequences of OW/OB predicted a drop in obesogenic food consumption but an increase in both TV viewing and child BMI percentile. The reason may have something to do with the message content or how the messages were framed by the health care provider. During pediatric clinical visits, specific messages about TV viewing are rarely made (Boyle et al., 2009; Spivack et al., 2010). In this study, 76.7% of parents reported that they did not receive any of the recommended communication from their health care provider about TV viewing. It may be that in the absence of a more complete discussion of screen-time limitations (including an explanation of the actual recommendations and why they are being made), mentioning the effects of TV time on child weight gain could result in a dismissive or reactive response. Scare tactics are not always effective in public health campaigns (Witte & Allen, 2000) and can sometimes cause a “boomerang” effect. Researchers and clinicians need to look more carefully at this particular type of message construction and delivery.

The analyses for $H_5$, testing the relationship between duration and each of the components of relational and informational support, also demonstrated a significant relationship between demographic characteristics and parents’ perceptions of how often health care providers discussed the risks of OW/OB. Specifically, non-Caucasian parents and those with higher BMIs reported having more frequent discussions about the risks and consequences of OW/OB. Knowing this might help shed light on possible reasons for the negative relationship between these discussions and both TV viewing and BMI. Because these messages are more frequently given to parents who often feel marginalized in discussions with their health care providers, and who we know receive care in a communicatively different way (Cooper et al., 2012, O’Connor, 2013) or who are assumed by their providers to be either more dismissive or defensive about these messages, the delivery of the messages might be implicitly framed in a way that is not positively received by parents (Sabin & Greenwald, 2012).
This study also found predictive relationships involving perceived informational value. Even though the two types of information satisfaction were positively correlated in the zero-order correlations, in the multivariate regression analyses, satisfaction with information quality and information quantity appeared to behave in opposite directions (with significant relationships with three of the five criterion variables—obesogenic food consumption, physical activity, and TV viewing). For these three variables, satisfaction with information quality predicted the outcome in the anticipated direction, whereas satisfaction with information quantity predicted it in the opposite direction. This may suggest that meeting parent needs in terms of perceived communication quality, rather than meeting parent expectations or preferences in terms of quantity, could possibly result in better weight-related pediatric outcomes. In contrast, focusing on meeting parents’ desires to get more or less information may sometimes be counter-productive. This poses an interesting division between what parents believe they want (or do not want), and in retrospect, what they themselves understood that they needed to hear. The implications of this are discussed in more detail below.

The other relevant aspect of informational value pertains to the influence parents ascribe to the advice provided to them by their pediatric health care provider. Significant relationships for this facet of value were found for the measure of physical activity, but not for food/nutrition or TV-related topics. Why might this be the case? One possibility might be that recommendations for types of physical activity are more concrete (e.g., going for walks or runs, engaging in a team sport, outside play). These suggestions may be easier to implement with less resistance from the children or other family members, as they require the addition of a potentially fun and/or family-oriented activity, rather than the removal of an activity that may have been providing enjoyment (like TV viewing or eating sweets). Physical activity adoption also may not be as cost prohibitive, depending on the situation, as some of the food-related recommendations (especially the addition of fresh fruits and vegetables). These reasons may make it easier for providers to give information (without offending or causing parents to lose face), and easier for parents to receive and implement it. Lastly, Hernandez et al. (2012) found that parents of preschoolers placed a much higher level of importance on eating behaviors than on physical activity as a contributing
factor in weight gain. It is possible that communicating recommendations about physical activity might be perceived as more influential by parents because it is less familiar to them and therefore may offer a more novel approach to weight management.

**Relational Support**

This study operationalized relational support as an aggregate of communicative factors that center around the provider-patient relationship and are widely thought to promote enhanced patient and family participation in the encounter (e.g., autonomy support, interpersonal treatment, communication), a sense of partnership with the provider (e.g., trust, contextualized knowledge of the patient/family), and increased satisfaction with the care received. As previously discussed, all of these are considered to be elements of family-centered care. The expectation was that higher levels of reported relational support would lead to a significant increase in anti-obesogenic behaviors, decreased enactment of obesogenic behaviors, and better weight-related outcomes overall. Interestingly, in contrast to what was expected based on these models of care provision, parent reports of a better relationship with their child’s health care provider predicted an increase in the consumption of obesogenic foods and an increase in child BMI percentile after one year.

On the surface these findings might seem to pertain solely to the development and maintenance of pediatric parent-provider relationships. However, these findings may offer insight into what motivates providers to talk about weight-related issues and what motivates parents to use the advice given to them by their providers. There are myriad reasons why providers might feel compelled to focus on relational support during well-child visits. First and foremost, the trend towards family-centered care practices has shifted focus more onto meeting patients’ expectations for their care, rather than just their physiological needs (Rao, Weinberger, & Kroenke, 2000). Parents often come to well-child visits primarily seeking reassurance that their parenting skills are on par and that their child is healthy and progressing at a developmentally appropriate rate—all without feeling judged or reprimanded for their parenting decisions (Garth et al., 2009; Heneghan et al., 2004; Radecki et al., 2009). Parents also come in seeking reassurance to alleviate worries about symptoms or potential medical conditions they fear their child might have
Research has suggested that patients find reassurances most helpful when they have a “trusting supportive relationship” with the provider and have trust in that provider’s expertise (Giroldi et al., 2014). Ultimately, providing this reassurance might facilitate liking, promote parental feelings of emotional support, and increase parents’ satisfaction with the care they receive, but there is little evidence to show that it facilitates behavior change.

This reassurance-seeking behavior may be somewhat related to the finding that satisfaction with information quantity predicts decreases in child physical activity. It is possible some that parents who receive little information about sensitive topics (like diet and exercise) are happy not to have to talk about them with their child’s health care provider. For those families, the negative association seems to make sense. Of course, health care providers who base the amount of information they provide upon what they feel the parents want (resulting in higher levels of satisfaction) could ultimately do their patients a disservice even if the parents are satisfied with this situation. Essentially, they may be focusing more on giving parents what they want to hear, rather than telling them what they may actually need to hear, all in the name of family-centered care.

Focusing on the relational aspects of care also gives providers a way to avoid dealing with difficult issues that parents not may not want to discuss (such as excessive child weight) and providing behavioral advice that parents may not want to hear (such as enforcing dietary changes that the child may dislike). They might also shy away from engaging in weight-related discussions because they believe that parents are not willing to make difficult changes in their family environment, or that spending time talking about it will not make any difference, especially in light of all of the other environmental influences on child weight.

There are also organizational-level influences that might affect how providers choose to focus their efforts. Providers have expressed the concern that that patients’/parents’ negative reactions to weight-related discussions will result in poor satisfaction ratings on formal post-visit evaluation forms (e.g., Press Ganey) which are highly valued by health care organizations as the basis for service/care-related rankings, and are now mandated as part of the Affordable Care Act (Birdstrike, 2013; Falkenberg,
Increasingly, health care organizations are either adding financial incentives for receiving high patient satisfaction ratings, tying a portion of the provider’s salary to these performance metrics, or making the continuation of their employment contingent upon receiving good patient satisfaction scores (Bridistrik, 2013; Glanz & Pitts, 2014). Not wanting to do anything to jeopardize the positive feelings attached to the provider-patient relationship, some providers may find it much easier (or less potentially confrontational) to focus on providing reassuring messages and developing a sense of trust and “open” communication, hoping that it will result in better satisfaction ratings in the short term, and better health outcomes further down the line. As Falkenberg (2013) summarized, “You can tell people to eat their vegetables all you want; they’re still going to remember more fondly the person who gave them a slice of cake (para. 28).”

In other medical contexts, tailoring care to meet patient expectations, rather than patients’ health-related needs, has reportedly led to a number of different negative health outcomes, in terms of care, cost for the patient and the health care system, and physiological well-being. Numerous reports have demonstrated that the focus on giving patients what they want (rather than the care they need) is associated with problems such as increased use of unnecessary diagnostic tests, antibiotic overuse, increased hospital admissions, longer hospital stays, and increased opioid pain medication prescriptions (Falkenberg, 2013; Fenton, Jerant, Bertakis, & Franks, 2012; Glanz & Pitts, 2014). Results of a recent national large-scale panel survey (N = 51,946) demonstrated that patients with higher satisfaction ratings of their health care provider spent more on health care costs and medication, had higher odds of being admitted to the hospital, and experienced higher mortality rates over the span of one year (Fenton et al., 2012). Although this evidence is from adult acute care settings, rather than well-child care, the idea that there are demonstrated negative health outcomes associated with higher levels of relational support (particularly satisfaction) provides an additional justification for continued exploration of these consequences in pediatric settings.

So, what happens when providers who have good relationships with their patients/families do decide to give weight-related behavioral recommendations, regardless of the potential difficulty or
uneasiness of the conversation, and despite the possibility of receiving lower satisfaction ratings? Even when families report that they have been given weight-related information from their providers, and regardless of whether or not they value that advice, ratings of relational support still significantly predict increased obesogenic food consumption and child BMI percentile. That suggests that parents who perceive that they have a more supportive relationship with their pediatric provider (in terms of trust, communication, etc.) may not be using information they might receive to inform their decisions, essentially discounting the advice. It may even mean that in some cases, children might end up engaging in increased levels of an undesirable behavior (e.g., eat more obesogenic foods), contrary to what was recommended. This happens regardless of either parent or child BMI, which were both controlled in this analysis.

It is possible that reassurances they receive from their provider negate (or at least weaken) the impact of any advice or information. Knowing that their provider thinks they are doing a good job of parenting, or that their child is generally healthy, may give parents license to dismiss specific behavioral recommendations, even if they are given in the spirit of healthy living or disease prevention. For child BMI, providers may also be dismissive of their own advice in the attempt to reassure parents that their children are still “normal” or “healthy” (e.g., “Her BMI is technically in the overweight range, but she is perfectly healthy and you are doing everything right. Just make sure that she keeps getting enough exercise, and she will be fine”). This type of statement acknowledges the problem, but also gives parents permission not to worry about it. It is easy to see how this type of statement could be counterproductive, as it does not send a clear message to parents about what advice is important to follow and what can be dismissed out of hand.

Overall, provider-parent interactions cannot focus primarily on relationship building and maintenance, with a side of information. Instead, the relationship should include the provision of information and advice that is relevant and useful to the families, delivered in a way that sends a clear message about the importance of enacting the behavior(s), without being overly reassuring and dismissive of potential problems. What this study demonstrates is that, at least in terms of child weight, positive
parent perceptions of the relationship they have with their pediatric provider do not necessarily predict better health-related outcomes. This relationship should be explored further.

**Weight-Related Behaviors and Child BMI**

It was expected that parent reports of obesogenic behaviors and anti-obesogenic behaviors in this sample would be significantly associated with child BMI percentile. This expectation was not supported. At Time 2, child BMI percentile was correlated with TV viewing, and although statistically significant, that association was relatively weak \( r = .14 \). In the regression analyses testing \( H_4 \), none of the reported behaviors predicted child BMI percentile at Time 2. There was reason to believe that at least for TV viewing and physical activity, there should be a significant association between the behavior and child weight status, even if for young children there was less evidence to conclude anything about the relationship between overall food consumption and BMI (see Jago et al., 2005; te Velde et al., 2012).

At Time 2, the children in this study were only 3-4 years old. Perhaps at this age these particular obesogenic and anti-obesogenic behaviors have not yet had a substantial effect on child BMI. Based on past research findings, this relationship should change as child age increases and the cumulative effect of obesogenic and anti-obesogenic habits presents as child weight. It is also possible that intake of fruits and vegetables in particular may not have much bearing on child weight. Looney and Raynor (2012) found that increased fruit and vegetable consumption did not result in a decrease in the consumption of other foods (including unhealthy snack food), resulting in overall increased caloric consumption. In other words, adding in healthy foods does not necessarily displace the intake of less-preferable energy-dense foods. In our study, it is worth noting that according to parental reports, obesogenic foods were not a major contributor to children’s overall caloric intake. This low-level of intake was relatively stable across the two years of the study \( r = .73 \), even though the children aged. It is possible that for this sample of preschool-aged children, obesogenic food just did not make up a significant enough proportion of their overall dietary consumption, and therefore had less impact on BMI. It is also possible that in a different sample, one that had a higher overall consumption of obesogenic foods (and/or a lower consumption of anti-obesogenic foods), the significance of the model might have been different.
Implications

Pediatric health care providers must gauge the best ways to communicate information about weight-related problems based on (a) their assessment of what the actual risk factors are for a particular child’s weight, and (b) information gained from interactions they have with each family over time, within the context of the provider-parent relationship. Tailoring communication to individual families is complicated for health care providers, who must gain an understanding of each individual patient and family in order to find out what information to communicate and how to best communicate it, so that it is contextualized and deemed valuable by the parents. This individualized communicative approach is central to the implementation of patient- and family-centered care practices. Care must be given to the construction, timing, and content of these messages. In general, communication about and around weight issues must be made with skill and empathy in order to be received well and in a productive way. It should not, however, be communicated with the primary goal of appeasing parental wishes and providing reassurance when those messages are not in the child’s best interests.

The results of this study should also serve to move providers (and professional organizations who provide care guidelines) past the idea that simply providing parents with information is enough to motivate or facilitate behavior change. Providing recommendations, in and of itself, does not qualify as effective provider-parent communication. It is also worthwhile to keep in mind that there is a limit to how many recommendations a parent can remember during a well-child visit—usually about six (Barkin et al., 2005). As a result, health care providers have to prioritize what information they communicate based on what they believe to be the family’s greatest needs and where they family is in the change process (based on the transtheoretical model of behavior change). The results of this study also suggest that parents contextualize the information they receive differently based upon their assessments of the quality of that information (and how satisfied they are with it) and the amount of influence their provider has in their decision making. Quality and influence appear to play a significant part in how much parents value and use providers’ behavioral recommendations, especially regarding physical activity and TV viewing.
With the trend toward providing family-centered care, many in the health care field have held on to the original notion (as advocated by Stewart, 2001) that it is inherently beneficial to attend to patients’ wishes regarding the way that they receive care. However, as many patients and parents want their physicians to provide expertise and guidance (given that they may have the ability to find health information themselves though online sources and social media), include them in decision making, and have a trusting provider-parent relationship (Radecki et al., 2009), health care providers have to achieve a delicate balance. Overall, from both a relational and informational standpoint, it appears possible that giving parents what they want, rather than what the child needs (or what the parent needs to hear), could result in the adoption of fewer anti-obesogenic behaviors, more obesogenic behaviors, and less-desirable weight-related health outcomes.

In terms of implications for research, the results of this study underscore the idea that we need to develop and employ a more nuanced approach to defining and measuring patient satisfaction—one that, in research, allows us to better differentiate between different types of satisfaction (e.g., quality, quantity, relationship, care provision), and in clinical settings helps to promote message quality. Further research must also be conducted to determine the best ways of educating and training pediatric providers so that they can learn how to effectively communicate with parents about weight-related topics, maximizing adherence to recommended health behaviors without sacrificing provider-patient relationships in the process. Additional areas for further research are described in more detail below.

Overall these relational and informational aspects of patient and family-centered care appear to account for between 2-5% of the variance for each of the outcome measures (above and beyond the substantial percentages accounted for by demographic characteristics and prior behavior). Although this may not seem like a lot given the sheer number of potential sources of influence on child weight and weight-related behaviors (see Figure 1), the potential that these pediatric sources account for any significant piece of the puzzle (no matter how small) will be of interest to health care providers, researchers, health management organizations, and governmental/non-governmental organizations who have focused efforts on reducing level of child OW/OB. At this point we may not understand the exact
mechanisms or reasons for these possible effects (assuming these are not artifacts of the measures themselves or from another source of error), but this preliminary research suggests that it may be worth future exploration into this area.

**Limitations**

**Sample.** Although efforts were made to gather as diverse a sample as possible within the region in which the data were collected, the findings of this study may not be generalizable to pediatric health care practices within more urban, predominantly non-Caucasian, or less-educated communities. Surveys were administered in written form and only in English, confining participation to literate English-speaking parents. Also, because the study design was longitudinal, only those families who were available at both Time 1 and Time 2 were included in the analyses. This omitted families who had moved or were more transient, and were likely unable to establish longer-term relationships with pediatric health care providers.

**Measurement and validity.** The questions assessing perceived informational value included an option for parents to choose “N/A” (not applicable) rather than a number on a Likert-type scale. Roughly 5% of parents chose the N/A option when asked how satisfied they were with either the quantity or quality of the information provided about food and nutrition. Overall, 27.9% of parents answered N/A regarding satisfaction with the quality of information regarding TV viewing, and 26.7% answered N/A regarding satisfaction with the quantity of TV viewing information. These responses were treated as missing data, and were therefore dropped from the analyses. For the food and nutrition variables, 65.2% of N/A responses were from those who reported receiving *none* of the 10 food-related recommendations. In addition, *all* of those who answered N/A regarding their satisfaction with the quality of TV information variables, and *all but five* of those answering N/A for TV-related information quantity, reported having received neither of the TV-related recommendations. This may have had an impact on predictive models involving these variables, as up to 35.5% of those who said they did not receive any TV-related information were subsequently dropped from the analysis.
The informational value questions also did not contain a domain-specific measure for satisfaction with the quantity or quality of information about physical activity. This was an oversight during the survey construction process, which resulted in the substitution of the food/nutrition measures for quantity and quality in the physical activity regression analyses. Although this was the best available substitute variable, it cannot be known whether having physical activity-specific questions would have yielded different results.

Question wording and available response options may have also had an effect on responses to the measure of relationship duration. In this analysis, relationship duration predicted parent perceptions of the provider-parent relationship, and some aspects of informational support, but not any health behaviors or BMI. However, this lack of findings might be an artifact of how the construct was measured. Although the intent was to measure the duration of the parent-provider relationship (with the understanding that the parent might have older children who have also seen this provider), the question specifically used the words “your child.” Parents could have interpreted this as how long the provider has seen this particular child or how long the provider has seen any children in that family. The intent was for the latter, but the wording of the item may have unintentionally constrained the responses. Only 5.3-5.6% said they had been seeing their pediatrician longer than what would have been possible for the child in our study, across the two surveys. One might expect this number to be higher, given how many of these children likely had at least one older sibling seeing the same practitioner. In future studies, researchers might get different results with differently worded or open-ended questions.

With regard to validity, although items taken from the PCAS were previously deemed internally reliable, and are used by researchers and healthcare administrators to assess the constructs they claim to measure, the high level of intercorrelation between subscales raises the question of whether each scale is externally valid. If the individual scales do not actually measure the communicative and relational constructs as described by the scale’s authors, the meaning of the aggregated scale would also be questionable. It is also possible that while the sub-scales have one meaning when used separately, the aggregated measure as used in this study requires a different interpretation (so that the whole does not
equal the sum of its parts). If combining subscales in this way reduces external validity, it could be a source of statistical noise or error in the analysis.

**Design.** As previously discussed, this study examined only parent perceptions of their interactions with their child’s health care provider during well-child visits. It did not take into account provider perceptions of informational and relational support (which tend to be positively associated with health outcomes; see Kelly, Kraft-Todd, Schapira, Kossowsky, & Riess, 2014 for a recent review), or the perspective of the child, who is also part of the interaction. Parent reports, like other forms of self-report, are susceptible to possible social-desirability effects. In this instance, it may be especially problematic for reports of child obesogenic food consumption, which is often perceived to be an undesirable behavior in need of control (e.g., Brown, Ogden, Vogele, & Gibson, 2008), and physical activity, which, thanks to national initiatives like Let’s Move (www.letsmove.gov), parents understand to be generally beneficial for their children’s health and well-being (Edwardson & Gorley, 2010). It is also possible that there are individual characteristics of parents (e.g., psychosocial or personality-based) that influence the way in which parents interact with their pediatric providers or their perceptions of these interactions, that are not accounted for in this analysis.

Finally, even though this was a longitudinal analysis, there were only two time points, separated by one year. It is possible that not enough time had passed between the data collection points for many statistical relationships to be observed. It takes time for families to implement many of the obesity-related behavioral recommendations made by pediatric providers, and some recommendations are more easily adopted than others (based on the family environment, habitual behaviors, cultural values/beliefs, social pressures, the physical environment, access to resources, and other factors idiosyncratic to each family). In addition, the results of these attempts at behavior change may not be immediate. It can take a while to develop new habits, and some change may be implemented gradually. It may also be the case that for families with preschool-aged children, some behaviors are more easily or quickly changed (e.g., eliminating sugar-sweetened beverages, increasing outdoor activity) than others (e.g., getting children to eat more servings of vegetables or watch less TV).
Future Work

This study represents the first step in a larger program of research that will continue to explore the ways in which pediatric communication can best facilitate the adoption of healthy weight-related behaviors while helping families to decrease the amount of obesogenic behaviors in which children engage. More specifically, it will explore the ways in which weight and weight-related behaviors are discussed during clinical interactions, and the effect this has on child weight status over time. There are a few natural next steps in the progression towards this goal.

The most immediate step is to examine the interactions between the predictive variables. The relational and information aspects of well-child visits do not exist in isolation from each other. Given that some of the relationships demonstrated in the individual multivariate regressions were negated or cancelled out in the omnibus model, it seems likely that some interaction(s) exist between different elements of these constructs. Once identified, these will hopefully add predictive value to the overall model.

Another potential route for future research would be to compare effects of relational and informational factors for children who were already overweight or obese with those for children who were normal-weight at Time 1. Prior evidence has shown that children who are already obese, or have had a history of above-normal BMI percentiles, are screened and treated at greater rates than those who appear to be of normal weight (Benson et al., 2009). Children who are formally recognized as OW/OB receive more information about and spend more time during clinical appointments discussing weight-related topics such as nutrition and physical activity (Barlow et al., 2007). Our study controlled for parent and child BMI, and examined relationships averaged across all BMI percentiles represented in the sample. Understanding how already being overweight influences the way that providers discuss weight-related information and maintain provider-parent relationships might help put some of this study’s findings in context.

Likewise, it would be informative to analyze the short and long-term effects of simply being told by one’s health care provider that one’s child is either overweight or underweight. There is qualitative
evidence to indicate that being told one’s child is underweight places emphasis on the need for the child to gain weight from an early age, creating a trajectory of obesogenic eating behavior that is difficult to change once the child is no longer underweight (Pagnini, et al., 2007).

Another possibility is that instead of using parent-reported child behaviors (some of which parents in this sample had to estimate, as the children spent at least half of each weekday in daycare) as criterion measures, investigators should instead examine parental behaviors and attitudes that relate more specifically to what happens in the family environment. These include monitoring or restricting TV viewing, monitoring or restricting food, family physical activity, and encouraging the child to engage in physical activity. This could also include an examination of how discussions with the pediatric health care provider affect parental perceptions of child health, or parent perceptions of their own health.

Understanding how healthy parents believe their children to be is one key element in understanding successful clinical communication, as well as the interpretation and adoption of behavioral recommendations.

Moving into a more qualitative arena, the findings of this study raise questions about what it is that makes parents “value” the information they receive from health care providers. What exactly is it that makes parents decide to follow some of a provider’s recommendations, but disregard others? These are questions that are probably best assessed by employing focus groups or through qualitative coding of semi-structured interview questions.

Finally, there are a number of organizational barriers that can affect the way in which provider-parent communication takes place during well-child visits, including visit length, wait time, and the extent to which patients get to see their regular health care provider—referred to as visit-based continuity (Murphy, Chang, Montgomery, & Safran, 2001; Safran et al., 1998). Understanding how these factors affect relationship formation, information provision, and perceived informational value will add not only to our understanding of these particular constructs, but to our overall knowledge about the effective provision of patient and family-centered care.
Conclusion

Researchers and medical professionals who attempt to prevent or treat OW/OB understand that it is not a problem with a single cause, nor does it have a single solution. It stands to reason that strategies for providing effective family-centered communication related to each of these causes need to be tailored—both in terms of the specific context of that cause (e.g., facilitators and barriers to change) and to the family who will be receiving the messages. A strategy that might seem effective in addressing one issue might be ineffective, or even have the opposite effect, when used to address another issue.

The findings from this study are important, both in terms of research into the clinical treatment and prevention of childhood OW/OB and in terms of the provision of family-centered pediatric primary care. They add to the existing body of literature on the factors influencing TV viewing, physical activity, and food consumption in preschool-age children, and demonstrate that there are communicative features of the pediatric provider-parent relationship that are relevant for developing child BMI. These findings help clarify which features of family-centered care may actually help promote positive behavior change (or at least have the potential to, under the right circumstances), and which might predict undesirable health outcomes.

Ultimately, fostering relational support (through interpersonal treatment, autonomy support, trust, and other elements of support) may heighten positive feelings about the interactions and the care delivered and received both for providers and families. However, these positive feelings may not necessarily lead to the adoption of healthy behaviors or better health outcomes for child patients, and could potentially have unanticipated or counterproductive consequences. The findings from study indicate the possibility that from both an informational and relational perspective, meeting parents’ expectations for what they want to get out of a pediatric interaction may not be as important for child health as addressing the family’s actual needs.
References


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Note: All variables are coded as follows: 1 = female, 2 = male, 3 = non-Hispanic White, 4 = other races/ethnicities.

For influence variables, they range from 0 to 1, with 0 representing the lowest level of influence and 1 representing the highest level of influence. Participants who chose the option for the satisfaction and influence variables were dropped from the analysis.
Table 2

**Relationship Support Characteristics (CISTAK)**

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<td></td>
</tr>
<tr>
<td>11. T2 Autonomy support</td>
<td>1.00</td>
<td>0.51</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. T2 Knowledge of patient/parent</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. All correlations significant at the 0.01 level (2-tailed). T1 = Time 1, T2 = Time 2*
<table>
<thead>
<tr>
<th>Predictor</th>
<th>Anti-obesogenic food consumption</th>
<th>Obesogenic food consumption</th>
<th>Physical activity</th>
<th>TV viewing</th>
<th>Child BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ΔR²</td>
<td>β</td>
<td>ΔR²</td>
<td>β</td>
<td>ΔR²</td>
</tr>
<tr>
<td>Parent gender</td>
<td>-0.02</td>
<td>0.62***</td>
<td>-0.05</td>
<td>0.29***</td>
<td>0.09^</td>
</tr>
<tr>
<td>Parent education</td>
<td>0.03</td>
<td>0.63***</td>
<td>0.08</td>
<td>0.62***</td>
<td>0.03</td>
</tr>
<tr>
<td>Parent race (white/non-white)</td>
<td>0.06</td>
<td>-0.19***</td>
<td>-0.12*</td>
<td>-0.12*</td>
<td>-0.02</td>
</tr>
<tr>
<td>Parent ethnicity (Hispanic/Non-Hispanic)</td>
<td>0.01</td>
<td>0.08*</td>
<td>-0.05</td>
<td>0.07</td>
<td>0.02</td>
</tr>
<tr>
<td>Household income</td>
<td>0.04</td>
<td>0.07</td>
<td>0.02</td>
<td>-0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Parent BMI</td>
<td>0.06</td>
<td>0.38***</td>
<td>-0.12^</td>
<td>0.38***</td>
<td>0.03</td>
</tr>
<tr>
<td>Child gender</td>
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<td>0.79***</td>
<td>0.06</td>
<td>0.79***</td>
<td>-0.04</td>
</tr>
<tr>
<td>Time 1 measure of DV</td>
<td>0.53***</td>
<td>0.03***</td>
<td>0.06</td>
<td>0.03***</td>
<td>0.02</td>
</tr>
<tr>
<td>Step 2: Relationship duration</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Relationship duration</td>
<td>0.06</td>
<td>-0.02</td>
<td>0.00</td>
<td>-0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Step 3: Information provision</td>
<td>0.01</td>
<td>0.01*</td>
<td>0.03**</td>
<td>0.01*</td>
<td>0.01*</td>
</tr>
<tr>
<td># of domain-specific recommendations</td>
<td>0.07</td>
<td>0.10*</td>
<td>0.12*</td>
<td>-0.11*</td>
<td>0.01</td>
</tr>
<tr>
<td>Risks &amp; consequences of OW/OB</td>
<td>-0.10^</td>
<td>-0.09^</td>
<td>0.09</td>
<td>0.09^</td>
<td>0.09*</td>
</tr>
</tbody>
</table>

Note. For BMI, the total # of recommendations given regarding obesogenic behaviors (food/nutrition, physical activity, and media use) was used in place of a single domain-specific recommendation.

Betetas for all variables are from the final step of the model. *p ≤ .10, *p ≤ .05, **p ≤ .01, ***p ≤ .001
Table 4

Perceived Informational Value as a Predictor of Time 2 Obesogenic and Anti-obesogenic Behaviors, as well as Child BMI

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Anti-obesogenic food consumption</th>
<th>Obesogenic food consumption</th>
<th>Physical activity</th>
<th>TV viewing</th>
<th>Child BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ΔR²</td>
<td>β</td>
<td>ΔR²</td>
<td>β</td>
<td>ΔR²</td>
</tr>
<tr>
<td>Step 1: Demographic and control variables</td>
<td>0.29***</td>
<td>0.62***</td>
<td>0.22***</td>
<td>.42***</td>
<td>.63***</td>
</tr>
<tr>
<td>Parent gender</td>
<td>-0.03</td>
<td>-0.05</td>
<td>0.10</td>
<td>0.09</td>
<td>0.05</td>
</tr>
<tr>
<td>Parent education</td>
<td>0.04</td>
<td>0.08</td>
<td>0.02</td>
<td>0.04</td>
<td>-0.10^</td>
</tr>
<tr>
<td>Parent race (white/non-white)</td>
<td>0.04</td>
<td>-0.20***</td>
<td>-0.11^</td>
<td>0.00</td>
<td>0.11**</td>
</tr>
<tr>
<td>Parent ethnicity (Hisp/non-Hisp)</td>
<td>0.02</td>
<td>0.08^</td>
<td>-0.06</td>
<td>0.06</td>
<td>0.00</td>
</tr>
<tr>
<td>Household income</td>
<td>0.05</td>
<td>0.08</td>
<td>0.02</td>
<td>-0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Parent BMI</td>
<td>0.05</td>
<td>0.16***</td>
<td>-0.10</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Child gender</td>
<td>0.00</td>
<td>0.06</td>
<td>-0.04</td>
<td>-0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Time 1 measure of DV</td>
<td>0.54***</td>
<td>0.79***</td>
<td>0.37***</td>
<td>0.64***</td>
<td>0.77***</td>
</tr>
<tr>
<td>Relationship duration</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Step 3: Informational value</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03*</td>
<td>0.01^</td>
</tr>
<tr>
<td>Satisfaction with information quality (domain-specific)</td>
<td>-0.09</td>
<td>-0.09</td>
<td>0.26**</td>
<td>-0.15</td>
<td>0.12</td>
</tr>
<tr>
<td>Satisfaction with information quantity (domain-specific)</td>
<td>0.04</td>
<td>0.11</td>
<td>-0.20^</td>
<td>0.11</td>
<td>-0.04</td>
</tr>
<tr>
<td>Influence of domain-specific advice on behavior</td>
<td>0.01</td>
<td>0.08^</td>
<td>n/a</td>
<td>0.13*</td>
<td>n/a</td>
</tr>
<tr>
<td>Influence on weight-related decision-making for the household</td>
<td>n/a</td>
<td>n/a</td>
<td>0.05</td>
<td>n/a</td>
<td>-0.10*</td>
</tr>
</tbody>
</table>

Total R² | 0.30 | 0.63 | 0.25 | 0.46 | 0.64 | 0.64 | 0.64 | 0.64 |

n | 225 | 210 | 203 | 195 | 197 |

Note. Overall informational influence is a calculated mean of scores of the other influence variables (Food, TV, and household decision making). Therefore only either the overall influence score or the component parts can be included in the predictive model. For BMI, the informational satisfaction variables (quantity and quality) were calculated as a mean of the food and TV-specific variables. For physical activity, the satisfaction with information quantity and quality variable for the food/nutrition domain were substituted. Betas for all variables are from the final step of the model. ^p ≤ .10, *p ≤ .05, **p ≤ .01, ***p ≤ .001
### Table 5

*Perceived Relational Support as a Predictor of Time 2 Obesogenic and Anti-obesogenic Behaviors, as well as Child BMI*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Anti-obesogenic food consumption</th>
<th>Obesogenic food consumption</th>
<th>Physical activity</th>
<th>TV viewing</th>
<th>Child BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\Delta R^2$</td>
<td>$\beta$</td>
<td>$\Delta R^2$</td>
<td>$\beta$</td>
<td>$\Delta R^2$</td>
</tr>
<tr>
<td><strong>Step 1: Demographic and control variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent gender</td>
<td>-0.02</td>
<td>-0.04</td>
<td>0.09$^*$</td>
<td>0.09$^*$</td>
<td>0.05</td>
</tr>
<tr>
<td>Parent education</td>
<td>0.04</td>
<td>0.09$^*$</td>
<td>0.03</td>
<td>0.04</td>
<td>-0.10$^*$</td>
</tr>
<tr>
<td>Parent race (white/non-white)</td>
<td>0.05</td>
<td>-0.19$^{***}$</td>
<td>-0.11$^*$</td>
<td>0.00</td>
<td>0.12$^{**}$</td>
</tr>
<tr>
<td>Parent ethnicity (Hisp/non-Hisp)</td>
<td>0.02</td>
<td>0.08$^*$</td>
<td>-0.05</td>
<td>0.06</td>
<td>0.01</td>
</tr>
<tr>
<td>Household income</td>
<td>0.05</td>
<td>0.08</td>
<td>0.01</td>
<td>-0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Parent BMI</td>
<td>0.06</td>
<td>0.16$^{***}$</td>
<td>-0.10$^*$</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Child gender</td>
<td>0.00</td>
<td>0.08</td>
<td>-0.04</td>
<td>-0.06</td>
<td>0.01</td>
</tr>
<tr>
<td>Time 1 measure of DV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2: Relationship duration</strong></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Step 3: Relational support</strong></td>
<td>0.00</td>
<td>0.01$^*$</td>
<td>0.01</td>
<td>0.00</td>
<td>0.01$^*$</td>
</tr>
<tr>
<td>CISTAK</td>
<td>0.03</td>
<td>0.10$^{**}$</td>
<td>0.07</td>
<td>0.03</td>
<td>0.10$^*$</td>
</tr>
<tr>
<td><strong>Total $R^2$</strong></td>
<td>0.29</td>
<td>0.63</td>
<td>0.23</td>
<td>0.42</td>
<td>0.64</td>
</tr>
</tbody>
</table>

**n**

272  249  268  273  233

*Note.* Betas for all variables are from the final step of the model. $^*p \leq .10$, $^*p \leq .05$, $**p \leq .01$, $***p \leq .001$
### Table 6

**Omnibus Hierarchical Multiple Regression Analysis Predicting Time 2 Obesogenic and Anti-obesogenic Behaviors, as well as Child BMI**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Anti-obesogenic food consumption</th>
<th>Obesogenic food consumption</th>
<th>Physical activity</th>
<th>TV viewing</th>
<th>Child BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\Delta R^2$</td>
<td>$\beta$</td>
<td>$\Delta R^2$</td>
<td>$\beta$</td>
<td>$\Delta R^2$</td>
</tr>
<tr>
<td><strong>Step 1: Demographic and control variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent gender</td>
<td>0.29***</td>
<td>-0.03</td>
<td>0.62***</td>
<td>0.22***</td>
<td>0.42***</td>
</tr>
<tr>
<td>Parent education</td>
<td></td>
<td>0.02</td>
<td></td>
<td>0.09</td>
<td>0.04</td>
</tr>
<tr>
<td>Parent race (white/non-white)</td>
<td>0.06</td>
<td>-0.18***</td>
<td>-0.12^</td>
<td>-0.01</td>
<td>0.10*</td>
</tr>
<tr>
<td>Parent ethnicity (Hispanic/non-Hispanic)</td>
<td>0.02</td>
<td>0.08^</td>
<td>-0.06</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Household income</td>
<td>0.04</td>
<td>0.06</td>
<td>-0.01</td>
<td>-0.04</td>
<td>0.06</td>
</tr>
<tr>
<td>Parent BMI</td>
<td>0.06</td>
<td>0.17***</td>
<td>-0.12^</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Child gender</td>
<td>0.00</td>
<td>0.07</td>
<td>-0.05</td>
<td>-0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Time 1 measure of DV</td>
<td>0.53***</td>
<td>0.47***</td>
<td>0.36***</td>
<td>0.62***</td>
<td>0.76***</td>
</tr>
<tr>
<td><strong>Step 2: Relational and informational support</strong></td>
<td>0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CISTAK</td>
<td></td>
<td>0.03*</td>
<td></td>
<td>0.05**</td>
<td>0.05**</td>
</tr>
<tr>
<td>Total # of domain-specific recommendations given</td>
<td>0.08</td>
<td></td>
<td></td>
<td>0.11^</td>
<td>0.10</td>
</tr>
<tr>
<td>Risks &amp; consequences of OW/OB</td>
<td>-0.09</td>
<td>-0.11^</td>
<td>0.10</td>
<td>0.14*</td>
<td>0.15**</td>
</tr>
<tr>
<td>Satisfaction with info quality</td>
<td>-0.11</td>
<td>-0.13^</td>
<td>0.24*</td>
<td>-0.18*</td>
<td>0.08</td>
</tr>
<tr>
<td>Satisfaction with info quantity</td>
<td>0.03</td>
<td>0.10</td>
<td>-0.23^</td>
<td>0.10</td>
<td>-0.09</td>
</tr>
<tr>
<td>Influence of domain-specific advice on behavior</td>
<td>0.01</td>
<td>0.09^</td>
<td>n/a</td>
<td>-0.16**</td>
<td>n/a</td>
</tr>
<tr>
<td>Influence on weight-related decision-making for the household</td>
<td>n/a</td>
<td></td>
<td></td>
<td>n/a</td>
<td>-0.18***</td>
</tr>
<tr>
<td><strong>Total $R^2$</strong></td>
<td>0.31</td>
<td>0.65</td>
<td>0.27</td>
<td>0.47</td>
<td>0.67</td>
</tr>
<tr>
<td>$n$</td>
<td>225</td>
<td>210</td>
<td>203</td>
<td>195</td>
<td>197</td>
</tr>
</tbody>
</table>

**Note.** Models for food consumption and TV viewing include the influence variables specific to that domain. Physical activity and child BMI models include the variable for overall informational influence on weight-related decision making for the household. For BMI, the informational satisfaction variables (quantity and quality) were calculated as a mean of the food and TV-specific variables. For physical activity, the satisfaction with information quantity and quality variable for the food/nutrition domain were substituted. Betas for all variables are from the final step of the model. *$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$
Figure 1. The Six-C's developmental ecological model of contributions to weight imbalance in childhood (Harrison et al., 2011).
Figure 2. Family-centered collaborative negotiation model (Tyler and Horner, 2008, p. 195).
Figure 3. Proposed data model. Dashed lines indicate possible bidirectional relationships or interactions that are out of scope for this analysis.
Figure 4. Summary of findings from the omnibus regression analysis (represented by solid lines) and the test of H₅ (represented by dashed lines).
Appendix: Survey Questions Categorized by Variable

Questions Measuring Relationship Support

Communication. Thinking about talking with your child’s regular health care provider, how would you rate the following: (Response Scale: 1 = Very poor, 2 = Poor, 3 = Fair, 4 = Good, 5 = Very good, 6 = Excellent)

- Thoroughness of the health care provider’s questions about your child’s symptoms and how he/she is feeling.
- Attention the health care provider gives to what you have to say.
- Provider’s explanations of your child’s health problems or treatments that he/she need.
- Provider’s instructions about symptoms to report and when to seek further care.
- Provider’s advice and help in making decisions about your child’s care.
- How often do you leave your child’s doctor’s office with unanswered questions? (Response Scale: 1 = Never, 2 = Almost, 3 = Some of the time, 4 = A lot of the time, 5 = Always)

Interpersonal treatment. Thinking about the personal aspects of the care you receive from your child’s regular health care provider, how would you rate the following: (Response Scale: 1 = Very poor, 2 = Poor, 3 = Fair, 4 = Good, 5 = Very good, 6 = Excellent)

- Amount of time your child’s provider spends with you.
- Provider’s patience with your questions or worries.
- Provider’s friendliness and warmth toward you and your child.
- Provider’s caring and concern for you and your child.
Satisfaction with your provider. Please answer the following questions:

- Would you recommend this health care provider to your family and friends? (Response Scale: 1 = Definitely no, 2 = Probably no, 3 = Not sure, 4 = Probably yes, 5 = Definitely yes)

- All things considered, how satisfied are you with your child’s regular health care provider?
  - [ ] Completely satisfied, couldn’t be better
  - [ ] Very satisfied
  - [ ] Somewhat satisfied
  - [ ] Neither satisfied nor dissatisfied
  - [ ] Somewhat dissatisfied
  - [ ] Very dissatisfied
  - [ ] Completely dissatisfied, couldn’t be worse

Trust. Thinking about how much you TRUST your child’s health care provider, how strongly do you agree or disagree with the following statements: (Response Scale: 1 = Strongly disagree, 2= Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly agree)

- I can tell my child’s doctor anything about my child, even things that I might not tell anyone else.
- My child’s health care provider sometimes pretends to know things when he/she is really not sure. (reversed)
- I completely trust my child’s health care provider’s judgments about my child’s medical care.
- My child’s health care provider cares more about holding down costs than about doing what is needed for my child’s health. (reversed)
- My child’s health care provider would always tell me the truth about my child’s health, even if there was bad news.
- My child’s health care provider cares as much as I do about my child’s health.
- If a mistake was made in my treatment, my child’s health care provider would try to hide it from me. (reversed)
- All things considered, how much do you trust your child’s health care provider? (Scale of 0= Not at all, to 8 = Completely)
**Autonomy support.** Physicians have different styles in dealing with patients, and we would like to know more about how you have felt about your encounters with your child’s regular care provider.

(Response scale: 1-7, where 1 = Strongly disagree, 4 = Neutral, 7 = Strongly agree)

- I feel that our child’s doctor has provided me choices and options for my child’s health care.
- I feel understood by our child’s doctor.
- Our child’s doctor conveys confidence in my ability to make changes for my child’s health.
- Our child’s doctor encourages me to ask questions.
- Our child’s doctor listens to how I would like to do things.
- Our pediatrician tries to understand how I see things before suggesting a new way to do things.

**Contextualized knowledge of patient.** Thinking about how well your child’s health care provider knows you and your child, how would you rate the following? (Response Scale: 1 = Very poor, 2 = Poor, 3 = Fair, 4 = Good, 5 = Very good, 6 = Excellent)

- Health care provider’s knowledge of your child’s entire medical history
- Health care provider’s knowledge of your responsibilities at work or home
- Health care provider’s knowledge of what worries you most about your child’s health
- Health care provider’s knowledge of you as a person (your values and beliefs)
Questions Measuring Perceived Information Provision

Here are a few more questions about the kinds of recommendations your child’s regular healthcare provider (e.g., a pediatrician, nurse practitioner, or general practitioner) makes for you and your child. Please check as many boxes as apply.

My child’s regular healthcare provider has recommended that I should ______________ (check ALL that apply):

- [ ] Limit my child’s consumption of sugar-sweetened beverages;
- [ ] Limit my children’s television and other screen time to no more than 2 hours per day
- [ ] Remove television and computer screens from children’s primary sleeping areas
- [ ] Limit eating at restaurants, particularly fast food restaurants
- [ ] Encourage my family to eat family meals (in which parents and children eat together)
- [ ] Limit my child’s portion sizes
- [ ] Limit my child’s consumption of energy-dense foods (foods that are high in calories, and low in nutritional value)

My child’s regular healthcare provider has recommended to me that my child should ____________ (check as many as needed):

- [ ] Eat breakfast daily
- [ ] Eat enough fruits and vegetables for my child’s size/age
- [ ] Eat a diet rich in calcium
- [ ] Eat a diet high in fiber
- [ ] Eat a balanced diet (including amounts of fat, carbohydrates, and protein)
- [ ] Participate in moderate to vigorous physical activity every day (spread throughout the day OR all at once)
Questions Measuring Perceived Informational Value

(1) How often does your child’s healthcare provider give you information on, or discuss, topics related to your child’s weight (e.g., food intake, exercise level)? (Response scale: 1 = Never, 2 = Occasionally, 3 = About half the time, 4 = Most of the time, 5 = Every visit)

a. Are you satisfied with the quality of information your child’s healthcare provider gives you regarding food and nutrition? (Response scale: 1 = Very unsatisfied, 2 = Unsatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very satisfied; plus an NA option)

b. Are you satisfied with the quantity of information your child’s healthcare provider gives you regarding food and nutrition? (Response scale: 1 = Very unsatisfied, 2 = Unsatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very satisfied; plus an NA option)

c. How much does your child’s healthcare provider’s advice about food and nutrition influence the decisions you make about what to feed your child? (Response scale: 1-5 scale; 1 = Doesn’t influence my decisions at all, 3 = Influences my decisions somewhat, 5 = Influences my decisions a lot; plus an NA option)

(2) How often does your child’s healthcare provider give you information on, or discuss, topics related to your child’s TV viewing (e.g., how much, type of programming)? (Response scale: 1 = Never, 2 = Occasionally, 3 = About half the time, 4 = Most of the time, 5 = Every visit)

a. Are you satisfied with the quality of information your child’s healthcare provider gives you regarding TV viewing? (Response scale: 1 = Very unsatisfied, 2 = Unsatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very satisfied; plus an NA option)

b. Are you satisfied with the quantity of information your child’s healthcare provider gives you regarding TV viewing? (Response scale: 1 = Very unsatisfied, 2 = Unsatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very satisfied; plus an NA option)
c. How much does your child’s healthcare provider’s advice about TV use influence the
decisions you make about TV watching in your household? (Response scale: 1-5 scale, with 1
= Doesn’t influence my decisions at all, 3 = Influences my decisions somewhat, 5 =
Influences my decisions a lot; plus an NA option)

(3) How often does your child’s healthcare provider discuss the risks and consequences of being
overweight (e.g., hypertension, high cholesterol, sleep problems)? (Response scale: 1 = Never, 2 =
Occasionally, 3 = About half the time, 4 = Most of the time, 5 = Every visit)

(4) How much do these discussions with your child’s healthcare provider influence the decisions you
make for your household (e.g., what to feed your child, how to structure his or her physical activities, the
amount of TV that your child watches)? (Response set: 1-5 scale, with 1 = Doesn’t influence my
decisions at all, 3 = Influences my decisions somewhat, 5 = Influences my decisions a lot; plus an NA
option)

**Question Measuring Relationship Duration**

How long has this person been your child’s regular health care provider?

- [ ] Less than 6 months
- [ ] Between 6 months and 1 year
- [ ] 1-2 years
- [ ] 3-4 years
- [ ] 4-5 years
- [ ] More than 5 years
Questions Measuring Food Consumption

The next questions ask about food your child ate or drank during the past 7 days. Think about all the meals and snacks your child had from the time he/she got up until he/she went to bed. Be sure to include food your child ate at home, preschool, restaurants, play dates, anywhere else, and over the weekend.

How many times did your child drink Non-Diet SODA POP (for example, Coke, Pepsi, or Mountain Dew), SPORTS DRINKS (for example, Gatorade), or FRUIT DRINKS that are not 100% Fruit Juice (for example, Kool-Aid, Sunny Delight, Hi-C)?

☐ Once a day  ☐ Twice a day  ☐ Three times a day  ☐ Four or more times a day

☐ One to three times during the past 7 days  ☐ Four to six times during the past 7 days

☐ My child did not drink any during the past 7 days  ☐ Don’t know

How many times did your child eat FRESH FRUIT, such as apples, bananas, oranges, berries or other fruit such as applesauce, canned peaches, canned fruit cocktail, frozen berries, or dried fruit? Do not count fruit juice.

☐ Once a day  ☐ Twice a day  ☐ Three times a day  ☐ Four or more times a day

☐ One to three times during the past 7 days  ☐ Four to six times during the past 7 days

☐ My child did not eat any fruit any during the past 7 days  ☐ Don’t know

How many times did your child eat FRENCH FRIES or other fried potatoes? Include tater tots, hashbrowns, etc., in your response.

☐ Once a day  ☐ Twice a day  ☐ Three times a day  ☐ Four or more times a day

☐ One to three times during the past 7 days  ☐ Four to six times during the past 7 days

☐ My child did not eat fried potatoes during the past 7 days  ☐ Don’t know
How many times did your child eat VEGETABLES (other than fried potatoes)? Include vegetables like those served as a stir fry, or stew, or side dishes, in your response.

☐ Once a day  ☐ Twice a day  ☐ Three times a day  ☐ Four or more times a day
☐ One to three times during the past 7 days  ☐ Four to six times during the past 7 days
☐ My child did not eat any vegetables during the past 7 days  ☐ Don’t know

How many times did your child eat a meal or snack from a FAST FOOD restaurant with no wait service, such as McDonald’s, Pizza Hut, Burger King, Kentucky Fried Chicken, Taco Bell, Wendy’s and so on? Consider both eating out, carry out, and delivery of meals in your response.

☐ Once a day  ☐ Twice a day  ☐ Three times a day  ☐ Four or more times a day
☐ One to three times during the past 7 days  ☐ Four to six times during the past 7 days
☐ My child did not eat any fast food during the past 7 days  ☐ Don’t know

How many times did your child eat candy (including Fruit Roll-Ups and similar items), ice cream, cookies, cakes, brownies, or other SWEETS?

☐ Once a day  ☐ Twice a day  ☐ Three times a day  ☐ Four or more times a day
☐ One to three times during the past 7 days  ☐ Four to six times during the past 7 days
☐ My child did not eat any sweets during the past 7 days  ☐ Don’t know

How many times did your child eat potato chips, corn chips such as Fritos or Doritos, Cheetos, pretzels, popcorn, crackers or other SALTY SNACK foods?

☐ Once a day  ☐ Twice a day  ☐ Three times a day  ☐ Four or more times a day
☐ One to three times during the past 7 days  ☐ Four to six times during the past 7 days
☐ My child did not eat any salty snacks during the past 7 days  ☐ Don’t know

Questions Measuring Physical Activity
Next, we would like to ask you a few questions about your child’s physical activity. If you are not sure of an answer, please estimate to the best of your ability.

We’re interested in how much time your child spends doing these activities on an average **WEEKDAY**. About how many minutes does your child spend… (circle the best answer for each type of activity)

<table>
<thead>
<tr>
<th>Activity</th>
<th>0</th>
<th>15</th>
<th>30</th>
<th>45</th>
<th>60+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor active playing</td>
<td></td>
<td></td>
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<tr>
<td>Indoor quiet playing</td>
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<tr>
<td>Outdoor active playing</td>
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<tr>
<td>Outdoor quiet playing</td>
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</tbody>
</table>

Next, how much time your child spends doing these activities on an average **WEEKEND DAY**. About how many minutes does your child spend… (circle the best answer for each type of activity)

<table>
<thead>
<tr>
<th>Activity</th>
<th>0</th>
<th>15</th>
<th>30</th>
<th>45</th>
<th>60+</th>
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<tr>
<td>Indoor active playing</td>
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<tr>
<td>Outdoor active playing</td>
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</tr>
<tr>
<td>Outdoor quiet playing</td>
<td></td>
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</tbody>
</table>
**Questions Measuring TV Viewing**

We’re interested in how much time your child spends doing the following activities. Please circle the best answer. If you don’t know the answer, circle “DK.”

About how many minutes or hours does your child usually watch TELEVISION:

On a typical WEEKDAY (Monday through Friday):

<table>
<thead>
<tr>
<th>Time Period</th>
<th>0</th>
<th>15</th>
<th>30</th>
<th>1 hr</th>
<th>2 hrs</th>
<th>3 hrs</th>
<th>4 hrs</th>
<th>5+ hrs</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>in the morning, before daycare</td>
<td></td>
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<td>during daycare</td>
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<tr>
<td>after daycare, before dinner</td>
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<tr>
<td>after dinner, before bed</td>
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</tbody>
</table>

On a typical WEEKEND DAY (Saturday or Sunday):

<table>
<thead>
<tr>
<th>Time Period</th>
<th>0</th>
<th>15</th>
<th>30</th>
<th>1 hr</th>
<th>2 hrs</th>
<th>3 hrs</th>
<th>4 hrs</th>
<th>5+ hrs</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>in the morning, before lunch</td>
<td></td>
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<td></td>
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<tr>
<td>after lunch, before dinner</td>
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<tr>
<td>after dinner, before bed</td>
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</tbody>
</table>
Endnotes

i The visual model creates zones based upon whether the factors relate to nutrition, activity, or personal/relational attributes. Additionally, factors are divided based on whether they are based on available resources and opportunities or behavioral practices.

ii This model is framed in terms of six interactive components: (a) exploring both the disease and the illness experience; (b) understanding the whole person; (c) finding common ground regarding management; (d) incorporating prevention and health promotion; (e) enhancing the patient-doctor relationship; and (f) being realistic. Stewart et al. (1995, 2003) categorize these components such that the first three address the process of health care delivery, and the final three address the context in which the provision takes place.

iii Issues surrounding inconsistencies in conceptualization, measurement, and operationalization were raised by Mead and Bower (2000, 2002), who suggest five distinct dimensions of PCC: (a) the biopsychosocial perspective; (b) the “patient-as-person” approach (creating an individualized understanding of illness); (c) sharing power and responsibility (attending to patient preferences); (d) the therapeutic alliance (developing common goals and a personal provider-patient relationship); and (e) the “doctor-as-person” influence (recognizing the effects of the provider’s personal characteristics).

iv In terms of total variance accounted for in these multivariate models, the authors found general provider-patient communication to account for 15%, the provision of disease-specific information (including discussion of health behaviors) 10%, dialogue about treatment plans 25%, overall satisfaction with the physician 11%, and trusting the physician 4%.

v RCC expands upon previously explicated models of PCC by focusing not only upon the clinician-patient relationships, but also the relationships between clinicians (including how these relationships function within the organizations and organizational culture in which they are situated), the relationship
between the provider and the local community, and the clinician’s relationship with his/herself. The provider-patient relationship remains the central focus of the approach, however Beach et al. (2006) contend that these relationships cannot be extricated or studied in isolation from the rest of the “web of relationships” represented by these other categories.

vi Although this is a useful extension of RCC, consistent with ecological approaches and family-centered communication, it relies on two assumptions: (a) the patients in question are adults; and (b) they are physically, mentally, and emotionally capable of making their own medical decisions and acting upon them. Therefore, this family-inclusive perspective would need to be adapted somewhat if it were to apply to families of dependent patients (e.g., the pediatric or geriatric interactions previously discussed).

vii All children between 0-2 years of age should have their growth plotted as weight-for-height.

viii Pediatric providers should also screen the child’s and family’s medical history—especially pertaining to obesity and weight-related comorbidities (e.g. Barlow et al, 2007).

_ix Rates of identification of were not significantly affected by sex, race, type of insurance, visit length, physician, or physician practice.

x This misperception, however, is generally not the result of parents’ inability to identify what an overweight child looks like. Two studies of young children and their parents (Hernandez et al., 2010; Warschburger & Kroller, 2009) found that most parents were able to correctly assess what a healthy body type looked like on a pictorial child body image measure (albeit with maternal education improving accuracy).

xi The congruence and influence of all of these factors is depicted in DeCivita and Dobkin’s (2004) dynamic model of pediatric treatment adherence, which provides a way of envisioning how treatment
adherence occurs within the triadic relationship, with the understanding that all behavior is influenced by individual factors and the environment in which they are situated (i.e., behavior = person x environment).

According to this perspective, in order to make effective recommendations for behavioral change, one first needs to know the target’s readiness to change. TM describes this readiness in five stages: (1) precontemplation (no interest in changing the behavior); (2) contemplation (thinking about making a change in the next six months); (3) preparation (intending to make a change within the next month); (4) action (having started making changes within the past six months); and (5) maintenance (maintaining changes more than six months after starting). The goal of a health care provider should be to move the patient through the stages, rather than exclusively focus on curing the illness, especially at the onset or in a single visit (Krebs, 2005).

Rhee et al. (2005) found that of families with children having BMIs at or above the 85th percentile, 38% were in the action/preparation stages, 17% in contemplation, and 44% in pre-contemplation. Analysis showed that parents were more likely to be in the action or preparation stages when the child was at least 8 years old, the parents thought the weight posed a health problem for the child, or the parents considered themselves to be overweight.

The scale, in its original form, contained one additional item (regarding end-of-life/DNR preferences), which was dropped after the STRONG Kids project team decided that it was not appropriate in a pediatric context.

Some researchers/theorists have argued that PCC and RCC are inherently communicative in nature (e.g., Lambert et al., 1997). Others (e.g., de Haes, 2006; Mead & Bower, 2000) critically assert that most operational definitions of PCC serve only as measures of “good communication” practices.
In a personal email from the administrator of the PCAS (at The Health Institute of the New England Medical Center, Tufts University), I was told that both questions have been used to assess satisfaction (with the former used more frequently than the latter), albeit as stand-alone items.

These sources also make recommendations regarding child sleep duration and family meal times. Sleep duration was excluded from this analysis because child sleep problems may have a variety of etiologies, some physiological, about which we lack data. Family mealtime behavior has been excluded because it is being fully explored by other members of the STRONG Kids Program team who are experts in the area.

The measures relating to dietary intake, physical activity, and media consumption were chosen for inclusion in the STRONG Kids Program panel survey by members of the project team with content-specific expertise in those areas of research. Members of the original team adapted validated measures and generated additional questions in order to make them appropriate for the target audience, and to maintain cohesion (e.g., in visual formatting or number of scale points) with the rest of the survey. Although the questions contained in these sections of the survey are extensive, only those relevant to pediatric recommendations for the prevention and treatment of childhood obesity are included in this analysis.

This category did not include flavored milk (cow’s milk or soy milk), which was captured as part of a different measure.

This particular analysis, along with the other aforementioned interaction analyses, was deemed out-of-scope for this dissertation research.