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Quantity, quality, content: An empirical examination of key integrity components in Early Head Start home visiting

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Quantity, Quality, and Content:
An Empirical Examination of Key Integrity Components in Early Head Start Home Visiting

by
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Abstract

Home visiting is model of service delivery that has many potential benefits for low-income families. Yet, ambiguous outcomes suggest the need for a comprehensive method of evaluating service delivery (Sweet & Appelbaum, 2004). In combining contemporary views of integrity that highlight the importance of both intervention delivery and reception (Power et al., 2005), and propose multiple dimensions of quantity, quality, and content as key components of home visiting (Raikes et al., 2006), a strong theoretical framework by which to evaluate service delivery emerges. Nevertheless, measurement indicators used to assess the key components of service delivery are often under-developed and lack psychometric validity (Sanetti & Kratochwill, 2009), particularly for parent-reported quality of home visiting. Therefore, the goals of this study included: (a) to develop in partnership with a program using home visiting as a mode of service delivery, the Home Visiting Process Scale (HVPS), a psychometrically-sound measurement tool for EHS programs to use in assessing the quality of home visiting services, (b) to empirically examine multiple components of home visiting service delivery proposed by Raikes and colleagues (2006), and (c) to comprehensively evaluate local EHS service delivery in relation to family characteristics and demographic risk. Results of Exploratory Factor Analysis (EFA) demonstrated a two-factor solution for parent-rated quality, representing the passive and active nature in which home visiting services are delivered and received (i.e., Delivery Quality and Response Quality). Furthermore, SEM analyses empirically-validated the tri-fold model of home visiting integrity, Quantity, Quality, and Content (Raikes et al., 2006). Quality emerged as a unique latent construct that was inversely associated with demographic risk. Child age at enrollment was also found to be a significant predictor of Quantity and Content of services. Implications for practice and directions for future research are provided.

Chapter 1: Introduction

Home visiting is a method of service delivery that has multiple benefits for low-income families (Sweet & Appelbaum, 2004). Home visiting programs are easily accessible, allow for the tailoring of services to a family's particular needs, and attempt to engage multiple family members in intervention activities (Wagner & Clayton, 1999). Moreover, home-based involvement, or the variety of behaviors caregivers do at home to promote their children's learning, appears to be preferred among culturally-diverse, low-income caregivers of young children (Fantuzzo, Tighe, & Childs, 2000) compared to more traditional forms of school- or center-based involvement. Given caregivers' preference for home-based involvement (Fantuzzo et al., 2000), home visiting is a viable option for promoting school readiness and parent-child interaction in a culturally-satisfying manner. Most importantly, specific home visiting programs, such as Early Head Start (EHS) have reported positive outcomes for a range of child and family outcomes, including cognitive and social emotional development (Love et al., 2005), as well as parenting skills (Stormshack, Kaminiski, & Goodman, 2002).

However, the effectiveness of home visiting as a method of service delivery overall still remains questionable. National evaluations of home visiting as a service delivery have found few studies that meet moderate-high scientific criteria (Paulsell et al., 2010). Of 11 national programs reviewed, only seven were identified as having adequate empirical support. Moreover, little research has been completed with culturally-diverse groups or families demographically at-risk (e.g., low caregiver education, single-parent families).

Multi-program evaluations of home visiting are further impeded by the enormous variation in specific intervention targets and goals that are inherent among programs using home visitation as a service delivery model (Sweet & Appelbaum, 2004). In a meta-analysis of home

visiting programs, Sweet and Appelbaum (2004) found positive, but modest, increases in cognitive and socioemotional outcomes associated with school readiness. Cognitive and socioemotional outcomes of home visiting programs were higher for home-visited children than for control group children, although these statistically significant differences did not necessarily translate into practical importance. Similarly, a review prepared for the First 5 California Children and Families Commission (Gomby, 2005) found that home visiting programs can produce benefits associated with school readiness for children and parents, but again the benefits were modest in magnitude.

Specific evaluations of home visiting programs, such as Early Head Start (Love et al., 2005), also found a minimal difference in Early Head Start children's, relative to comparison children's, receptive vocabulary gains at the end of the program when children were three years old. Furthermore, an evaluation of the Home Instruction Program for Preschool Youngsters (HIPPY) program (Baker, Piotrkowski, & Brooks-Gunn, 1998) found no significant impact on early literacy abilities immediately following the program, although significant differences in literacy abilities between HIPPY and comparison children emerged one year later.

Assessment of Integrity in Home Visiting Evaluations

Overall, there remains a need to elucidate what researchers have identified as the "blackbox" of home visiting (Korfmacher, 2006). Modest or mixed outcomes do not necessarily diminish the value of home visiting as a model of service delivery. Beyond weak study designs or variations among programs, prior large scale evaluations are further impeded by the lack of a thorough understanding of service delivery and integrity. Evaluating service integrity is the primary method for assessing the internal validity of an intervention (Sanetti & Kratochwill, 2009). In evaluations with mixed results regarding intervention effectiveness, comprehensive

assessment of program integrity (i.e., content and process) allows for the examination of key components related to successful (or unsuccessful) implementation (Perepletchikova & Kazdin, 2005).

Despite that home visiting programs demonstrate promise in promoting child and family success (Love et al., 2005), little extant research has examined intervention integrity or how intervention implementation is related to outcomes. Of the major evaluations for specific home visiting programs that focus on child and early academic development (i.e., EHS, HIPPY, Parents As Teachers), assessments of integrity are limited to aspects of general program participation (i.e., "persisters vs. "non-persisters"), completion of broad program performance standards (Baker, Piotrowski, & Brooks-Gunn, 1998; Love et al., 2005; Wagner & Clayton, 2003), or program drop-out status (Roggman et al., 2008). However, of the studies that examine integrity in relation to outcomes, Roggman et al. (2008) found program enrollment duration to be linked to important outcomes, such children's vocabulary scores, the HOME environments, and parents' supportive play practices.

Although reception of program services is necessary for families to receive program benefits as demonstrated in Roggman et al. (2008), many families are unable to complete the prescribed protocols of 24-36 months of home visiting. Prior research has identified attrition rates between 35-51% for families participating in over a year of home visiting services (Duggan et al., 2000; Fergusson et al., 2005). Therefore, further monitoring of how programs are implemented is needed to identify intervention components and to understand program processes that support families in completing the program and reaching successful outcomes (Perepletchikova & Kazdin, 2005; Peterson & McConnell, 1993). However, even though numerous researchers (Korfmacher et al., 2007) call for more detailed documentation of integrity

in evaluation of home visiting programs, intervention integrity is often neglected in favor of evaluating program outcomes (Dusenbury et al., 2003). Despite the potential outcomes for children and families (Sweet & Appelbaum, 2004) without appropriate assessments of integrity, the true effectiveness of home visiting as a model to deliver specific interventions (e.g., Early Head Start, Parents as Teachers) remains unclear.

Challenges in Home Visiting Integrity Assessment

Although recognized as a critical process in maximizing child/family outcomes, examining implementation of program content and service delivery is difficult within the private and intimate context of a home visit (Roggman et al., 2001). Personal factors such as demographic and cultural influences or a family's present level of functioning and needs have been shown to inhibit family participation in the delivery of home visiting programs (Bracaliello, Manz, & Caskie, 2009; Raikes et al., 2006). Furthermore, the inherent variability across program-specific content makes it difficult to appropriately measure issues related to integrity (Korfmacher et al., 2008). For these reasons, assessments of home visiting that link integrity to outcomes have typically focused upon service dosage globally, a generic measure of the *quantity* of home visitation, excluding the rich process of home visiting and ignoring specific content (Baker et al., 1998; Culp et al., 2004; Wagner & Clayton, 2003; Woolfolk & Unger, 2009). However, contemporary views of treatment integrity have emphasized not only the *quantity* of intervention, but also its *quality* and *content* (Raikes et al., 2006), in assessing the ways in which a program is both delivered and received (Power et al., 2005).

Multidimensional Models of Integrity Applied to Home Visiting

Raikes and colleagues (2006) identify three key components that programs should consider when examining program integrity: a) quantity of participation with program, b) quality

of participant engagement during visits and c) the focus of the content during the visit. Specifically, Raikes and colleagues (2006) defined quantity as the frequency of visits, duration of home visiting, the intensity of visits over a period of time, and the length of each visit. Quality of home visiting refers to the mean rating of caregiver engagement for each home visit and an overall global rating of engagement by program staff. Lastly, content of home visiting was categorized as mean percentages of time spent on child-focused activities, family-focused issues, or rapport building with the client. Overall, major findings reported by Raikes and colleagues (2006) emphasized the importance of all three home visiting components (i.e., quantity, quality, content) in supporting child and family outcomes.

Yet, broader conceptualizations recognize intervention integrity as multidimensional process between the provider and family. Power and colleagues (2005) emphasizes integrity as both the way in which a program is *delivered* as designed and also as whether it is *received* by participants as intended. Moreover, Power and colleagues' (2005) bi-directional model suggests that integrity is dynamic in that the delivery of a program influences its reception, which in turn affects the delivery and so on. Therefore, in combining the Raikes and Power models, it becomes necessary to examine both the delivery and the reception of each of the key components of quantity, quality, and content in home visiting, in a comprehensive assessment of the integrity of home visiting (see Figure 1).

Using this framework, Raikes and colleagues (2006) discuss *quantity* of home visiting in terms of how many visits were offered to a family and how many were in fact received, respectively examining both delivery and reception of services. Yet, *content* can also be discussed in terms of what was prescribed (e.g., goals) and what was actually applied during the session, such as child-focused content or goals completed. Likewise, in using Power and

colleagues (2005) to expand upon the model of Raikes and colleagues (2006), *quality* of home visiting then also refers to both how well an intervention is implemented and how well an intervention is received. For example, quality of implementation is reflected in the level of competence delivered by the home visitor, as well as the level of engagement among participants receiving the intervention. Yet, often how the intervention is received, specifically the quality of how participants or families are engaged, has been empirically ignored in the research. Lastly, Power and colleagues (2005) identifies the context in which the intervention is delivered and received, or in other words the relationship between home visitor and family, as an important indicator of implementation. This type of close bi-directional relationship between client and service provider, also known as the therapeutic alliance, has been found to be the most consistent predictor of client outcomes (Horvath, 2000; Martin, Garske, & Davis, 2000). Therefore, the nature of the relationship between home visitor and family is another critical dimension that needs to be assessed in examining quality of home visiting.

Overall, results of large scale evaluations are insufficient in the traditional sense if the program content was not implemented the way it was designed- or more broadly, if the home visiting process was not delivered or received by the family as intended (Power et al., 2005). Therefore, evaluations should include assessments of both the process and the content of home visiting (Power et al., 2005). In examining the tri-fold indicators of integrity (i.e., quantity, quality, content) proposed by Raikes and colleagues (2006), evaluations can more thoroughly distinguish service delivery and specific intervention effects when analyzing program outcomes.

Limitations in Home Visiting Integrity Research

Despite advancements in conceptual notions of intervention integrity and the use of scientifically rigorous evaluations of home visiting services (Love et al., 2005; Wagner &

Clayton, 2003), the research examining intervention integrity is lagging behind. Besides the

landmark EHS evaluation study by Raikes et al. (2006), no studies have comprehensively

evaluated home visiting services with all three components of quantity, quality, and content.

Although only a sparse amount of studies have even addressed aspects related to program

implementation, a number of limitations warrant attention in the current home visiting integrity

research. Overall, the literature examining integrity in home visiting is descriptive and

correlational, with insufficient conclusions based upon small samples and qualitative cases.

Moreover, measurement indicators of quantity, quality, and content are often incomplete and

rudimentary, and rarely include family perspectives in evaluations (c.f., Korfmacher et al., 2007;

Roggman et al., 2001).

Measurement Indicators of Integrity

Of the studies that do examine home visiting integrity, many commonly employ some

measure of home visiting quantity or program participation. Most frequently, the number of

home visits (Culp et al., 2004; Korfmacher et al., 2007; Raikes et al., 2006; Wagner & Clayton,

2003; Woolfolk & Unger, 2009) or the percentage of program attrition/active (Duggan,

McFarlane, Fuddy et al., 2005; Fergusson et al., 2005; Wagner & Clayton, 2003) is recorded as

an indicator of home visiting quantity. Also to a lesser extent, some studies evaluated home

visiting quantity by examining the duration of home visiting services over time, the average

length of each visit, or the intensity of services (e.g., visits) received over time (Korfmacher et

al., 2007; Raikes et al., 2006).

Although content or focus of home visiting is presumed to match program goals or

program curriculum, little research clearly measures this critical indicator of integrity. However,

a few studies provide directions for assessing the content of home visiting through the use of

systematic direct observation or consistent, standardized recording of content codes (Culp et al., 2004; Peterson et al., 2007; Raikes et al., 2006; Roggman et al., 2001). Roggman and colleagues (2001) as well as Peterson et al. (2007) use the Home Visiting Observation Form (HVOF; McBride & Peterson, 1997). Although the HVOF provides clear valuable information on the content of home visiting, the measure captures only a short sampling of home session behavior (i.e., often a single visit). Raikes et al. (2006), on the other hand, assessed content of home visiting by examining the percent of time across multiple home visits that was either child-focused, family-focused, or focused on rapport building. This broad indicator represents the two-pronged approach of EHS and Head Start to support both caregivers and their children.

Despite the entreaty of home visiting researchers, quality of home visitation is often neglected in evaluations of home visitation integrity. Of the three components of home visiting defined by Raikes et al. (2006), quality of the home visitation is the most problematic to measure. Measurement of quality of home visitation is difficult as there has been little consensus on how quality is conceptualized and defined. Across the literature, home visiting quality is often indicated as single dimensions such as home visitor/visiting procedures (Baker et al., 1998; Raikes et al., 2006), the relationship between visitor-family (Brookes et al., 2006; Sharp et al., 2003), and family engagement (Korfmacher et al., 2008). With the exception of Roggman et al. (2001), studies have typically evaluated aspects of home visiting quality in an isolated, fragmented manner. Few studies have examined a combination of one or two of these indicators of quality (Korfmacher et al., 2007; Peterson et al., 2007; Roggman et al., 2001).

Although each of these studies provides insight on how home visiting quality is conceptualized and defined, studies examining multiple aspects of home visiting quality provide the broadest perspective of home visiting processes. Only Roggman et al. (2001) used multiple

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methods to assess the three comprehensive dimensions of quality- quality of visit, relationship, and family engagement. Roggman et al. (2001) included caregiver ratings for both the quality of the home visit and the quality of the relationship between staff and family. Although statistically adequate scaling (i.e., factor analysis) was not conducted, the surveys demonstrated high internal consistency. Staff also provided ratings of the quality of home visits globally defined on a five-point scale, in addition to completing scales assessing family functioning and progress. Lastly, quality of family engagement was assessed by researchers via a global rating included in conjunction with direct observation.

Despite the laudable efforts of researchers examining multiple aspects of quality (Roggman et al., 2001), measurement procedures with unknown psychometric properties of reliability and validity have limited the measurement of home visiting quality. Although observational tools provides a direct assessment of home visit quality, these tools are often time and labor intensive and provide limited information beyond the immediate observation session. Rather, rating scales provide an effective method of capturing the perspective of multiple raters of overall home visiting quality in a time and cost efficient manner (Sanetti & Kratochwill, 2009). However, whether examining quality of the home visit, relationship between visitor-family, or family engagement, a number of previous studies have used only one to three items rated by staff to assess these complex and multifaceted constructs (Korfmacher et al., 2007; Raikes et al., 2006; Sharp et al., 2003).

Furthermore, despite the highly personal and contextualized nature of home visiting, the family's perspective of home visiting quality is largely ignored in the literature. Although measures of staff-rated home visiting quality (Roggman et al., 2008a) and family satisfaction (Roggman et al., 2008b) exist, there are no psychometrically sound measures for caregivers to

rate the multiple dimensions quality of home visiting (e.g., home visiting activities, family engagement, visitor-family relationship). Moreover, existing assessments of home visiting are frequently created top-down by program administrators or researchers, rarely including families as partners in measurement development. Yet, in order to more appropriately capture what aspects of home visiting that are most meaningful and important to families (Nastasi et al., 2000), caregivers' perspectives must be included when developing a measure of home visiting quality.

Summary of Need

As evident in the reviewed literature, in order to support home visiting as a model of service delivery, comprehensive evaluations of integrity are needed to understand *how* home visiting is effective (Korfmacher et al., 2008; Sweet & Appelbaum, 2004). Evaluations should furthermore examine *for whom* home visiting is effective, paying particular attention to the home visiting process for families who have demographic risk factors (Duggan et al., 2000; Fergusson et al., 2005). The conceptual models presented by Power and colleagues (2005) and Raikes and colleagues (2006) provide researchers with a rich, multidimensional view of service delivery in proposing quantity, quality, and content of services as key components of home visiting. However, in previous studies examining integrity (Brookes et al., 2006; Korfmacher et al., 2007; Peterson et al., 2007; Sharp et al., 2003), measurement indicators used to assess key components of service delivery, particularly *quality of home visiting*, are often poorly developed and lack psychometric validity. Furthermore, home visiting integrity indicators of quality are expert-driven and rarely include the perspective of the families served.

Accordingly, the purpose of the present research is: (a) to develop in partnership with local EHS stakeholders, the Home Visiting Process Scale (HVPS), a psychometrically-sound and

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practical measurement tool for EHS programs to use in assessing the quality of home visiting services, (b) to evaluate multiple indicators of home visiting service delivery in relation to the comprehensive model of integrity proposed by Raikes and colleagues (2006), and (c) to comprehensively evaluate the local service delivery of Community Services for Children/Early Head Start in relation to family characteristics and demographic risk.

Research Questions and Hypotheses

In order to appropriately examine the inter-relatedness of home visiting components (i.e., quantity, quality, and content), a multidimensional and psychometrically-adequate measurement tool assessing the quality of home visiting was first developed. *Question 1: What are the underlying psychometric properties of the Home Visiting Process Scale (HVPS), a practical measurement tool for EHS programs to use in assessing the quality of home visiting services?* Consistent with previous research (Korfmacher et al., 2008; Roggman et al., 2001), it is hypothesized that quality of home visiting services will be multidimensional and will be evident in both indicators of the delivery and reception of the program by families (Power et al., 2005). Exploratory analysis will empirically examine aspects of quality conceptualized in the previous research literature, such as (a) home visitor competence, (b) family response or engagement in home visiting, and (c) the relationship between the home visitor and the family (Korfmacher et al., 2008; Roggman et al., 2001). Furthermore, although the measurement tool is designed to reflect anticipated changes in constructs (i.e., visitor-family relationship, family engagement) over the time (Korfmacher et al., 2008), we hypothesize that the measure will be adequately stable ($r = 0.8$-0.9) within a short period of 2-3 weeks.

Question 2: Does the Home Visiting Process Scale, the newly developed measure of quality, in conjunction with indicators of home visiting quantity and content, fit the conceptual

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model proposed by Raikes and colleagues (2006)? It is hypothesized that the three integrity measures will conform to the conceptual model proposed by Raikes and colleagues (2006). Measured indicators of key home visiting components will match the proposed latent constructs of quantity, quality, and content of home visiting (see Figure 2). Furthermore, it is anticipated that key components of home visiting indicators will be substantially inter-correlated (Raikes et al., 2006).

     Question 3: How are local EHS family characteristics and demographic risk variables related to the empirically-validated constructs of home visiting integrity? Delivery of the key integrity components (i.e., quantity, quality, and content) are expected to vary in regards to family characteristics and demographic risk (Raikes et al., 2006). However, the current study is largely exploratory in that the majority of the sample will represent diverse Latino families. Previous research has found African American families to be less likely to receive child-focused visits compared to other demographic groups (Raikes et al., 2006). Furthermore, in regards to quality indicators, non-English speaking Latino mothers were found to be the most engaged in home visiting. However, the present work greatly extends both the measurement of parent-reported quality in home visiting (i.e., HVPS) and the modeling of latent constructs of home visiting integrity and, therefore, will report exploratory findings.

Chapter 2: Literature Review

Although home visiting programs demonstrate promise in promoting child and family success (Love et al., 2005; Sweet & Appelbaum, 2004), little extant research has examined intervention integrity, or how program processes are related to program outcomes. Of the major evaluations for home visiting programs that focus on child development and early academic development (Baker et al., 1998; Love et al., 2005; Wagner & Clayton, 2003), assessments of integrity are limited to aspects of program participation or broad completion of program implementation.

Assessment of Integrity in Major Home Visiting Evaluations

Baker and colleagues (1998), for example, investigated the impact of the HIPPY program on a range of child cognitive and academic skills. However, in assessing home visiting integrity, Baker et al. (1998) only identified rates of program completion and described the ranges of parents' self-reported ratings of involvement. In another major evaluation of home visiting, Wagner and Clayton (2003) examined child development and health outcomes, as well as parenting skills and the home environment for families participating in the Parents as Teachers (PAT) program. Despite the experimental rigor (Wagner & Clayton, 2003), program integrity was only modestly examined in relation to general participation. Participants were deemed as "persisters" compared to "non-persisters" or non-completers. Families who completed at least one year of program services (irrespective of the number of sessions) were considered "persisters" and demonstrated the greatest impacts on child development outcomes. Even though Wagner and Clayton (2003) use a threshold to define of quantity participation and connect this assessment to child outcomes, their investigation of integrity is insufficient. Little is understood regarding the quality and content of home visitation from this evaluation, rather this

conceptualization places the burden on the families' ability to connect (or persist) with the program.

Lastly, despite employing a randomized-controlled design, Love et al. (2005)'s large scale evaluation of Early Head Start (EHS) home visiting also lacks a thorough assessment of integrity in relation to program outcomes. Love et al. (2005) examined integrity according to the program's stage of implementation, or when Head Start performance standards were fully implemented during the time of the evaluation. Of the 25 broad programs standards, six programs were defined as early implementers, six as late implementers, and five programs did not completely implement program standards. More favorable results in terms of child outcomes were found for early or late implementers. However, findings were not consistent across groups. Although, performance standards were assessed, the standards applied to home- and center-based programs and were *non-specific* to the content or process of home visiting.

Major Components of Home Visiting Integrity

Raikes and colleagues (2006), however, identify three key indicators in which home visiting programs should consider in examining integrity: a) quantity, b) quality, and c) content. Quantity of participation refers to the number of visits, over how long a period of time and duration of visit. Quality of home visiting refers to an average rating of caregiver engagement in each home visit and an overall global rating of engagement. Content of home visiting refers to the average percentages of time that was spent on child-focused activities, family-focused issues, or rapport building with the client. Results of the EHS evaluation by Raikes et al. (2006) emphasized the importance of all three home visiting components (i.e., quantity, quality, content) as key indicators connected to child and family outcomes. Specifically, whether the visit was

"child-focused" or "family-focused" in terms of *content* was most strongly connected to child outcomes.

Further contemporary conceptualizations recognize intervention integrity as bi-directional. Power and colleagues (2005) discusses integrity in relation to not only how a program is *delivered* but also how it is *received* by participants. Specifically, traditional perspectives of integrity focus upon whether programs where delivered in the precise manner that they were designed to be implemented. Power and colleagues' (2005) expanded view of integrity identifies the need to examine the way in which programs are actually received. Moreover, the dynamic model suggests that the way a program is delivered impacts the way it is received and vice versa. Therefore, it becomes critical to examine both the delivery and the reception of the key components of quantity, quality, and content in home visiting, in order to more fully assess intervention integrity and understand program implementation.

As discussed in the seminal work of Raikes and colleagues (2006), *quantity* of home visiting is measured in terms of how many visits were offered to a family and how many were in fact received, respectively examining both delivery and reception of services. Yet, *content* can also be discussed in terms of what was prescribed (e.g., goals) and what was actually applied during the session, such as child-focused content or goals completed. Moreover, *quality* of home visiting then also refers to both how well an intervention is implemented and how well an intervention is received. For example, quality of implementation is reflected in the level of competence of the home visit (i.e., delivery), as well as the level of engagement among participants (i.e., reception). Participant engagement is therefore viewed as an essential dimension of treatment integrity (Power et al., 2005). Moreover, Power and colleagues (2005) identifies the context in which the intervention is delivered and received, or in other words the

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relationship between home visitor and family, as an important indicator of implementation. Yet, often how the intervention is received, specifically how the quality of how participants or families are engaged, has been ignored in the research thus far.

Limitations of Home Visiting Integrity Research

Despite the conceptual advancements in the notion of intervention integrity and the use of scientifically rigorous designs in large-scale evaluations of home visiting services for children's early academic and social-emotional development (Love et al., 2005; Wagner & Clayton, 2003), evaluations examining intervention integrity is lagging behind. Other than the landmark EHS evaluation study by Raikes and colleagues (2006), no studies have comprehensively evaluated home visiting services with all three components of quantity, quality, and content. Although clear, comprehensive assessments of integrity have not been included in large scale home visiting evaluations, a small number of studies have examined components of home visiting implementation. However, even in this growing body of literature, a number of limitations warrant attention in the current home visiting integrity research.

Overall, the literature examining integrity in home visiting is descriptive and correlational, with conclusions drawn based upon small samples and qualitative cases. Methods for the development of integrity indicators in the literature are not well described. The majority of studies reviewed did not report their method for developing integrity assessment. Some studies, such as the EHS evaluation (Love et al., 2005), used pre-defined program standards. None of the studies identified in the present review included families in the development of integrity indicators. Furthermore, in terms of integrity assessment and ratings, studies typically focused on home visitor/staff report of integrity. In addition, surprisingly few studies actually included family perspectives (Roggman et al., 2001) in evaluations.

Measurement Indicators of Integrity

Moreover, in general, the methods and measurement indicators of quantity, quality, and content in home visiting assessments are often incomplete and rudimentary, lacking psychometric validity.

Quantity. Of the studies that examined home visiting integrity, they most commonly employed some measure of home visiting quantity, as a reflection of program participation. Most frequently, the number of home visits (Culp et al., 2004; Korfmacher et al., 2007; Raikes et al., 2006; Wagner & Clayton, 2003; Woolfolk & Unger, 2009) or the percentage of program attrition/active (Duggan et al., 2005; Wagner & Clayton, 2003) is recorded as an indicator of home visiting quantity. Also to a lesser extent, some studies evaluated home visiting quantity by examining the duration of home visiting services over time, the average length of each visit, or the intensity of services (visits) received over time (Korfmacher et al., 2007; Raikes et al., 2006).

Content. Although content or focus of home visiting is presumed to match program goals or program curriculum, little research has clearly measured this important indicator of integrity. For example, Love et al. (2005) broadly identified program standards and defined the setting of EHS services as home-based, center-based, or combination, yet did not provide any specific evaluation of the content of visits during home-based services. Similarly Duggan et al. (2000) loosely identified content of home visiting by examining whether prescribed services (i.e., developmental assessments and screenings) were received on time. Qualitative studies, such as Hebbler and Gerlach-Downie (2002) included the use of videotapes to examine content. However, despite its direct observation of content of home visiting, only minimal description is provided that indicates the content of home visits was aligned with program goals for a small number ($n = 21$) of participants.

However, a few studies provide clear directions for assessing the content of home visiting, whether through the use of systematic direct observation or consistent, standardized recording of content codes (Culp et al., 2004; Peterson et al., 2007; Raikes et al., 2006; Roggman et al., 2001). For example, Roggman and colleagues (2001) as well as Peterson and colleagues (2007) use the Home Visiting Observation Form (HVOF; McBride & Peterson, 1997). The HVOF is an observational tool that is used to directly examine the content of home visiting. Despite that the HVOF provides information from a direct observation, the measure is a only a sampling of home behavior in a particular session.

Lastly, another method of examining content as an indicator of home visiting is through the use of recording time spent in home visiting content areas. Culp et al. (2004) examined home visiting content by requiring visitors to record the amount of time spent on each of 9 content areas during home visits prenatally, 0-6 months, and 6-12 months. Interestingly, Culp et al. (2004) found that the percentage of content spent on the various areas was dynamic and changed over time according to goals and curriculum emphasized by the program. For example, initially families spent a majority of time on maternal personal health (30%) prenatally, although later in the program families spent the majority of time on child development (41%).

Similarly, Raikes and colleagues (2006) chose to assess content of home visiting by examining direct ratings of the time spent in visits that was either child-focused, family-focused, or building rapport with the family. Although relatively simplistic, the dichotomous focus of content represents the two-pronged approach and goals of Early Head Start to support both caregivers and children. Home visitors recorded the overall percentages of time spent in child- or family-focused in each visit and averages were computed for each family.

Quality. Despite the entreaty of home visiting researchers, quality of home visitation is often neglected in evaluations of home visitation integrity. In the current review, less than half of studies reviewed even minimally assessed some aspect related to quality. Besides Raikes et al. (2006), the only large-scale evaluation to include a measure of home visiting quality was Baker et al. (1998), which included a self-reported, global rating of caregiver involvement in the program.

Of the three components of home visiting defined by Raikes and colleagues (2006), quality of the home visitation is the most problematic to measure. Measurement of quality of home visitation is difficult as there is no common consensus on how it is conceptualized and defined. Across the literature, quality of home visiting is measured in single dimensions, such as quality of the home visit (Baker et al., 1998; Raikes et al., 2006), quality of the relationship between visitor-family (Brookes et al., 2006; Sharp et al., 2003), quality of family engagement (Korfmacher et al., 2008), or a combination of these indicators of quality (Korfmacher et al., 2007; Peterson et al., 2007; Roggman et al., 2001).

For example, Baker and colleagues (1998) chose to report the descriptive percentages of parent ratings of self-involvement in visitation as an indicator of engagement. On the other hand, Peterson and colleagues (2007) used direct observation of videotapes to record parental engagement every ten minutes during a home visiting session. In measuring relationship, Sharp et al.(2003) calculated internal consistency (α=.89) of using three items of the Working Alliance Inventory- Bonds scale (WAI: Horvath & Greenburg, 1989). Furthermore, Korfmacher and colleagues (2007) conducted a Exploratory Factor Analysis (EFA) on the Helper-Relationship Inventory rating scale (adapted from Nurse-Client RI: Barnard, 1992) and identified one factor accounting for 79% of the variance in the visitor-family relationship. Although each of these

studies provides insight on how home visiting quality is conceptualized and defined, studies examining multiple aspects of home visiting quality provide the richest perspective of the processes of home visiting.

Only Roggman and colleagues (2001) used strong methodology and multiple methods to assess all three proposed dimensions of quality- quality of visit, relationship, and family engagement. Roggman and colleagues (2001) included caregiver ratings for both the quality of the home visit and quality of the relationship between staff and family. Although adequate scaling analysis was not conducted, the 14-15 item scales demonstrated high internal consistency ($\alpha = >.99$) In addition, staff also provided ratings of the quality of home visits globally defined on a five-point scale. Lastly, quality of family engagement was assessed by researchers via a global rating included with direct observation using the HVOF. Ratings of higher quality were descriptively connected to examples of successful families. Yet, the results of this study may be limited in generalizability. The sample of Roggman and colleagues (2001) consisted of predominantly Caucasian, Mormon families in a rural setting.

Furthermore, despite the laudable efforts of researchers examining multiple aspects of quality (Roggman et al., 2001), weak measurement procedures with unknown psychometric properties of reliability and validity have limited investigations of home visiting quality. For example, whether examining quality of the home visit, relationship between visitor-family, or family engagement, a number of previous studies have used only one to three items rated by staff to assess these constructs (Korfmacher et al., 2007; Raikes et al., 2006; Sharp et al., 2003). Given the intimacy of visitation within one's home, this is far too few items to capture the richness of home visiting.

Chapter 3: Method

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Participants and Setting

Children and families from our partner, Community Services for Children, Inc./Early Head Start (CSC/EHS), served as participants for this research. As a regional program, CSC/EHS serves families with young children from birth to three-years of age in a mix of urban and rural communities located throughout Lehigh and Northampton counties in Pennsylvania. Reflecting the local demographics, Latino families (62%) constitute the single largest racial group served by CSC/EHS, followed by smaller proportions of Non-Hispanic/Latino (37%) and Arabic (<1%) families. Moreover, over 43% of CSC/EHS families are primarily Spanish speaking. Although EHS serves children up to three years of age, children between two to three years of age are the largest age group served (56%). About 7% of the EHS children have documented disabilities, with speech and language delays being the most prevalent disability identified.

Of note, CSC/EHS serves families whose incomes are well below federal poverty thresholds. Current program demographics indicate that 60% of the families have incomes falling 25 to 74% below federal poverty thresholds. Half of the families (53%) have two parents, 42% are single-mother families, and the remainder of the families is characterized as single mothers who are living either with partners or extended families.

The Child Development Partners (CDPs), who conduct weekly home visits with CSC/EHS families, are primarily Latino (70%). Moreover, half of the CDPs are Spanish

speaking. Among the current group of CDPs, the majority (67%) have served as CDPs for CSC/EHS for 3 years or longer, indicating stability among this group of staff members. Although all CDPs have a minimum of a high school education, five CDPs have Bachelor of Science degrees in various human service areas, and 78% of the CDPs have CDA certification. Generally, CDPs serve nearly 10-12 families each.

Survey participation. All families in the local EHS program (n = 162) were approached by their home visitor for consent to participate in the study. In an effort to promote participation, small incentives were offered to families. Every family that consented to participate and completed the Home Visiting Process Scale received a $5 gift card to Walmart. In total, the sample included 121 families from the local EHS program (74.7% response rate). Demographic data for the families that chose not to participate are not available. None of the families that consented to participate discontinued with the study following consent.

Measures

The current study examines a number of measures related both to the demographic and cultural characteristics of the families in the local CSC/EHS as well as measurement of the key indicators of home visiting integrity.

Child/Family characteristics. The following demographic and cultural variables were routinely collected by CDPs during time of enrollment in CSC/EHS service: (a) caregiver race/ethnicities, (b) caregiver age, (c) caregiver education, (d) primary language of household, (e) number of children in household, (f) child age at enrollment/exit, and (g) child' disability status.

These data were extracted from the CSC/EHS records by the student investigator and recorded for each EHS family. At the onset of the study, each family was assigned a unique

identifier to ensure confidentiality for the purpose of the current study. All data were retrieved or recorded according to each family's unique identification number. Furthermore, any data linking personal information to the identification numbers is password protected and maintained only by the student investigator.

Key components of home visiting integrity. A range of indicators across the three components of home visiting integrity (i.e., quantity, quality, and content) were examined. The data from the *quantity* and *content* indicators presented here were retrieved by the student investigator directly from children's files held at the CSC/EHS administration building following the completion of the program year in June. Similar to the procedures for recording demographic and cultural characteristics, the student investigator recorded the home visiting information next to the child/family's unique identifier, protecting all personally-identifying information.

Quantity of home visiting. Similar to Raikes and colleagues (2006), quantity was assessed in terms of (a) the number of visits a family has received over the course of their time in the program (potential range of 0-3 years), (b) the duration of visiting in weeks (one visit is prescribed per week), and (c) the intensity of visitation, identified as the average rate which families received the specified weekly home visits each month.

Content of visiting. Content or focus of visiting was assessed by measuring the number of planned goals identified in weekly home visit session records in the following broad areas that represent the comprehensive content of the CSC/EHS, such as: (a) child health/nutrition, (b) child development and learning, (c) child behavior, and (d) family-focused objectives. These data were retrieved by individually inspecting participant files of home session logs and tallying the number of goals in each area.

Quality of home visiting. As evident in the review of previous literature, a parent-reported, psychometrically-sound measure of home visiting quality does not exist. However, a main purpose of this study was to develop, in partnership with stakeholders, a meaningful measure that assesses quality of home visiting, the Home Visiting Process Scale (HVPS). The underlying constructs of the HVPS were investigated in the first stages of data analysis (see Results below). The resulting measure consists of 19 questions rated on a 5-point Likert scale (e.g., Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree). The two-factor solution of the HVPS captures the quality of home visiting services as delivered by home visitors (Delivery Quality) and the quality of family's response to the home visiting services they receive (Response Quality).

Procedures

Overview. The study took place across two years October 2010 - October 2012. In total, 11 phases were planned for project implementation. Lehigh University's Institutional Review Board (IRB) approved the project in October 2010. The initial project activities (Phases 1-2) were devoted to forming the partnership team and collaboratively planning research activities. Next, the largest portion of time (Phases 3-4) was spent developing the Home Visiting Process Scale (HVPS) to measure quality of home visiting services through repeated focus groups and an iterative process of communication and feedback with stakeholders. Following approval of content and face validity and adequacy of Spanish translation by stakeholders (Phases 5-6), the HVPS measure was collected program-wide (Phase 7) and administered a second time shortly after to determine test-retest reliability (Phase 8). Routine home visiting data already collected by CSC/EHS was retrieved at the end of the program year (Phase 9). Next, the HVPS data and retrieved data were subjected to rigorous statistical analysis and modeling procedures in

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evaluation (Phase 10). Finally, the later portion of the project focused upon manuscript preparation, and translating research findings into practical implications for the program (Phase 11).

Phase 1: Partnership formation activities. Participatory action research places priority on partnering with stakeholders in order to create research outcomes that are acceptable, empowering, and sustainable. Partnerships can help ensure that research is relevant to community members, uses the language of the population, and reflects values and beliefs of members of the culture (Nastasi et al., 2000). The current investigators and CSC/EHS stakeholders collaboratively discussed and planned all stages of the research project to ensure partnership, including: (a) the identification of the research topic and questions of mutual interest, (b) co-construction of measure development (c) and the data collection process to ensure procedures are acceptable and feasible to EHS, (d) team planning for the interpretation of results, and (e) the translation of these findings into practical and meaningful recommendations for the local EHS.

The CSC/EHS coordinators and staff vocalized particular interest in maximizing the service delivery of their home visiting program and understanding the critical processes that make home visiting effective for all participating families. In co-constructing measurement with EHS families and program staff through iterative focus groups, the variables of interest assessed provide valuable information to stakeholders. Furthermore, in collaborative planning data collection procedures, this project was able to connect with naturally-occurring processes, including retrieval of existing data and using routine home visits as avenues for data collection, to ensure project completion as well as acceptability to EHS. Following interpretation of the results of this project, EHS staff and the current student investigator met to discuss implications

for practice and action plans for program development as a team. Lastly, in continuing scholarly dissemination, this study will enhance both local and national EHS systems by preparing the Home Visiting Process Scale, as well as additional key findings that will enable other EHS programs, early childhood educators, and families to extend the results gained from this research project.

Partnership team formation. A partnership team is crucial for providing guidance, as well as accountability, for ensuring adherence to the partnership process described above (Fantuzzo, Tighe & Childs, 1997). The student investigator developed a core partnership team of stakeholders, representative of key CSC/EHS staff and families to guide and monitor the research activities as proposed in this study. Representing CSC/EHS was Pam Cho (Director of Child Development Services), two Child Development Partners (CDPs), and two caregivers enrolled in CSC/EHS. To facilitate the participation of family representatives in the Partnership Team meetings, they were given a stipend of $250 to assist with the costs associated with child care and transportation. Each family received $125 over the course of the project period. For each of the five partnership meetings, $25 was allotted for time and transportation costs.

CSC/EHS contact person. In addition to forming and engaging a Partnership Team, Pam Cho (Director of Child Development Services) was elected as the CSC/EHS contact person to further support a strong working collaboration with the student investigator. The contact person had three major responsibilities throughout the project year: routine (e.g., bi-monthly) contact with the student investigator to oversee measurement development and evaluation activities; to communicate and coordinate with the student investigator in planning major activities (e.g., CDP training, start of data collection); and to report any questions or difficulties experienced by CDPs or family members that may need immediate attention.

Phase 2: Partnership meetings. A total of five partnership meetings were scheduled during the course of the study. The partnership meetings were held in conjunction with naturally-occurring program events, such as monthly EHS Parent Policy Council meetings in local HS centers.

Partnership meetings 1-2. The student investigator met with the Partnership team to officially introduce the project to the Partnership team and to prepare for initial focus groups. Next, a partnership meeting discussed family and staff response to the initial focus groups. Progress in developing the content of Home Visiting Process Scale (HVPS), as well as challenges in holding focus group, were discussed at this time.

Partnership meetings 3-4. Prior to the start of data collection, assessment protocols, training for CDPs, and data collection procedures were collaboratively discussed with partnership team members in Partnership Meeting 3. Following this meeting, a training was held to introduce the Home Visiting Process Scale (HVPS) to all CDP home visitors. A script was provided to CDPs as a method of presenting the project, including informed consent and purpose of the measure, to families. Questions and concerns were collaboratively discussed at this time. During the collection of the HVPS, in Partnership Meeting 4, team members discussed data collection progress and concerns related to the program wide administration, as well as plans for the reliability assessment with a sub-sample of the initial participants.

Partnership meetings 5-6. In the final partnership meetings, the data were presented back to stakeholders in Partnership Meeting 5 and discussed. Following this shared understanding of the data, clear recommendations based upon the assessment were presented to team in Partnership Meeting 6. Furthermore, in linking research to practice, the team collaboratively

discussed the potential recommendations and developed an action plan to enhance the service delivery of their program.

Phase 3: Initial focus groups. In order to construct a contextually-relevant measure of caregiver beliefs about the quality of home visiting services needed for the current study, one must access the perspectives of families and staff members in early childhood settings. Utilizing a participatory action research framework to design such instruments offers the advantage of enhancing cultural sensitivity and meaningfulness to the people who might use and benefit from the information it produces (Nastasi et al., 2000). Moreover, focus groups are an especially effective method for accessing the perspectives of stakeholders, namely teachers and parents of young children (Gaskins, 1994).

As stated previously, during Partnership Meetings 1 and 2, the core Partnership Team collaboratively planned and discussed focus group procedures in the development of the HVPS for this study. Focus groups were held repeatedly with new participants until the content collected was qualitatively exhausted. Focus groups were approximately 90 minutes and were held in varying local HS centers across the Lehigh Valley. During each of these focus groups, participants responded to broad questions related to the aspects of quality previously conceptualized in the literature (Roggman et al., 2001).

In review focus groups, items were placed on a 5-point Likert scale, indicating agreement of the item as an indicator of quality (1=Strongly Disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly Agree). Participants individually rated each item as to whether they agree or disagree that the item measures home visiting quality and made suggestions for revisions.

EHS families and CDPs were invited to participate in focus groups through the use of multiple methods. Focus groups for CDPs occurred during mandatory staff meetings were all

CDPs are required to attend. In order to ensure sample representativeness, EHS families were recruited via staff nomination (CDPs and Parent Policy Council), in addition to program-wide recruitment flyers announcing scheduled meeting times, locations, and incentives. For staff nominations of families, each CDP were asked to nominate 3-4 families that would be interested in participating in the focus groups.

Furthermore, arrangements were made to hold focus groups in conjunction with *naturally-occurring* Parent Committee meetings held by CSC/EHS. This is an important aspect of the project that likely promoted focus group participation, as it built upon the existing transportation and translation services routinely provided by the program for these meetings. Moreover, family representatives of the EHS Partnership team volunteered to co-lead these meetings with the student investigator to promote participation and engagement. Given the large number of Spanish-speaking families in the current EHS population, one additional focus group was offered to be conducted entirely in Spanish. Despite multiple recruitment attempts the Spanish-speaking focus group did not have any participants.

As incentives for participation, each EHS family received a $5 gift card to Walmart for attending a focus group. CDPs were provided with a snacks and refreshments during their mandatory staff meeting.

Phase 4: Item development of the HVPS. Informed by theory (Power et al., 2005; Raikes et al., 2006) and prior conceptualizations of quality in the literature (Roggman et al. (2001/2008), survey items were derived from focus group content. After all focus groups have been completed, the transcribed notes were reviewed and examined for major themes that emerged across focus groups. Following an initial theme analysis, an independent observer

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repeated the process identifying themes. Items were created based upon unique content embedded in the themes until the content was exhausted.

Phase 5: Review focus groups. The preliminary measure was then presented in review sessions to EHS families individually and to CDPs in a similar manner as described in Phase 4. During this review time, participants were asked to rate the accuracy of each item (i.e., How well does this item represent the aspect of quality?) and importance (How important is this item to ask?) on a 4-point scale, and to respond to a set of questions related to the appearance of the scale (e.g., Is the font of the text too small?). As incentives, each EHS family participating in the review received a $5 gift card to Walmart for attending a focus group. Again, CDPs were provided with a snacks and refreshments during their mandatory staff meeting.

Following this second focus group review, the student investigator examined the items in regards to their average ratings across participants. The highest rated items across accuracy and importance were selected, in addition to suggested refinements to enhance the appearance and accessibility of the scale. This pilot version of the HVPS was then presented back to EHS stakeholders during Partnership Meeting 3 for a final review of content and clarity.

Phase 6: Translation of the HVPS. After the partnership team approved item content and face validity, the measure was translated into Spanish by an academic translator at Lehigh University and back translated by bi-lingual EHS staff. The bilingual staff members were asked to provide any suggestions for the words or phrasing chosen in the translation. Next, the academic transcriber reviewed the back translation and determined if there was consistent meaning across the two versions of the scale, English and Spanish. Upon final revisions, the final translation was re-reviewed by the CSC/EHS bilingual to ensure item meaning and clarity. The

final translation of the pilot product was presented to and inspected by CSC/EHS administration, staff, and families during a partnership team meeting.

Phase 7: Field test of the HVPS. Prior to assessment, the process for data collection procedures and training for CDPs were collaboratively discussed in Partnership Meetings 3 and 4. Accordingly, the student investigator provided a 60-minute training to assist all CDPs in presenting the HVPS to families. The training took place during a mandatory, routine CSC/EHS staff meeting or in-service. During this time, the process of discussing informed consent with families and data collection procedures was thoroughly described and modeled by the student investigator. In general, after consenting to participate in the project, CDPs asked families to complete the measure in English or in Spanish at a time that is convenient for them and to place the measured in a manila sealed envelope provided by the student investigator. Families had the option of having the sealed manila envelope picked up the following week during their routine home visit or to mail in a business reply envelope with the complete survey at no cost to them.

A pre-determined script accompanied CDPs in presenting the packet to families. The script outlined the project's purpose, instructions for filling out the measure, and incentives for participation. The script also provided the contact information of the student investigator. CDPs instructed the families to contact the student investigator if they had questions or wished to have assistance in completing the measure. Families with low literacy skills had the option of having the surveys read to them by the student investigator in person or over the phone. All EHS families that choose to participate received a $5 gift card to Walmart.

Phase 8: Reliability assessment. Twenty-eight families who originally participated in the initial HVPS assessment and were representative of the larger EHS program in terms of race/ethnicity and primary language were randomly selected to participate in a second HVPS

administration 6-8 weeks after the initial field testing (Crocker & Algina, 1986). The additional assessment provided insight into the test-retest reliability and stability of the HVPS. Data collection procedures for the retest were the same as for the initial distribution of the HVPS. As an extra incentive for these families to participate again, each family that participated by filling out the measure a second time received an additional $10 Walmart gift card.

Phase 9: Retrieval of existing home visiting data. Extensive demographic data are routinely collected each year by CSC. These data include self-reported information on family race and ethnicity, primary language spoken at home, family type/structure, child race and ethnicity, caregiver's education, etc. Home visiting data (i.e., demographics, quantity, and content indicators) were retrieved through examination of families' home session records. Data were extracted and all families were assigned a unique identifier to promote confidentiality for the purpose of the current study. Any data linking personal information to the identification numbers was password protected and maintained only by the student investigator.

Phase 10: Data analysis and interpretation. Following data collection activities and retrieval of existing data, Exploratory Factor Analysis (EFA) of the HVPS measure and a measurement model testing approach was used to examine key home visiting integrity indicators in Structural Equation Modeling (SEM). (Data analysis procedures and rationale are further detailed in Chapter 4)

Phase 11: Dissemination activities. In Partnership Meeting 6, the student investigator provided clear recommendations for practice, and the partnership team discussed plans for enhancing program service delivery. Further dissemination activities planned include regional and national presentations as well as submission for publication to peer-reviewed journals.

Data Analysis

        Question 1. *What are the underlying psychometric properties of the Home Visiting Process Scale (HVPS), a practical measurement tool for EHS programs to use in assessing the quality of home visiting services?* In order to examine the dimensions of home visiting quality, an Exploratory Factor Analysis (EFA) was conducted on the data collected in the HVPS. Although no power analysis is available for EFA, large samples over 100 participants are recommended for the use of statistical scaling analyses (Gorsuch, 1983). Furthermore, the HVPS questionnaire consisted of 19 items and met recommendations for having an item:participant ratio of at least 5 participants per scale item (i.e., 95). The total sample of 121 family/child participants was therefore acceptable.

        In preliminary analysis, data were examined for skewness, kurtosis, and missing items. Missing items were qualitatively examined to discern if patterns are random or systematic. For participants missing less than 15% of data at random (i.e., no more than 3 items missed), values were imputed in SPSS (Rubin, 1987). If the distribution of the data did not meet assumptions regarding normality, the data were transformed (taking the square root, logarithm, squaring) depending upon the skew. The transformations change the magnitude of the data values; however, they do not change the relative order of the values (Tabachnick & Fidell, 2007). Furthermore, basic assumptions regarding the adequacy of sample size, communalities and correlation matrices, Bartlett's test of Sphericity, and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were examined.

        In EFA, a series of principal axis factoring analyses were conducted to discern a statistically-sound and meaningful factor structure. Both orthogonal and oblique rotations were examined for the most parsimonious factor structure. EFA solutions were examined in relation to

the following criteria (Gorsuch, 1983): (a) eigenvalues > 1.0, (b) percent variance > 5% (c) visual analysis of the drop in the scree plot, (d) a minimum number of 3-5 items per factor, (e) internal consistency (Cronbach's alpha) $\geq$ .70, (f) minimal inter-correlation ($r = 0.3-0.6$) of unit-weighted factors, and (g) theoretical meaningfulness. Finally, all factor structures that meet statistical criteria (i.e., a – f), were examined prior to selecting the final structure based upon its fit with theoretical literatures.

In order to test the temporal stability of the measure, 20% of the scale development sample were randomly selected and matched according to caregiver ethnicity and version of the HVPS completed (i.e., English or Spanish) 6-8 weeks following the first administration. Pearson r correlations conducted on factor scores across the two time points served as the primary method for examining measurement stability. Correlations above $r = 0.8$ were considered to be acceptable and highly stable.

Question 2. *Does the Home Visiting Process Scale, the newly developed measure of quality, in conjunction with indicators of home visiting quantity and content, fit the conceptual model proposed by Raikes and colleagues (2006)?* Structural Equation Modeling (SEM) using AMOS software version 19.0 was the primary method examining whether the proposed model of "quantity, quality, and content" by Raikes and colleagues (2006) fits the sample data. SEM is the appropriate method of data analysis as it is a statistical technique for testing and estimating relationships that uses a combination of statistical data and qualitative causal assumptions (Schumacker & Lomax, 2004). In general, SEM represents it as a model, "operationalizes" the constructs of interest with a measurement instrument, and tests the fit of the model to the obtained measurement data (Hu & Bentler, 1999). Here, the observed data indicators of integrity were examined in relation to the three-dimensional model (i.e., quantity, quality, and content)

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proposed by Raikes and colleagues (2006) and expanded by Power and colleagues (2005) in the notion of integrity delivery *and* reception.

A major strength of SEM is the ability to construct latent variables. Latent variables are not measured directly, but are estimated in the model from several measured variables each of which is predicted to 'tap into' the latent variables. This allows the researcher to explicitly capture the unreliability of measurement in the model and estimate the structural relations between latent variables more accurately. Furthermore, SEM analysis allowed the researcher to examine the relative strength of individual indicators of the key components. As seen in Figure 2, there are three latent variables (i.e., quantity, quality, content) in the original model with three corresponding indicator variables each. The latent variable of quantity represents how much home visiting a family receives, and is measured by a) the total actual number of visits received, b) the duration (in months) the family has been enrolled in the program, and c) the intensity of service provision (the percentage of visits completed that were prescribed). Quality represents how the home visiting program was delivered and received by the family, and is measured by the subscales of the HVPS, Delivery Quality and Response Quality. Lastly, the latent variable of content represents what was the focus of the visiting, and is measured by a) the number of child development goals, b) the number of child health/nutrition goals, and c) the number of family support goals recorded in the weekly home session logs. Goals are collaboratively set by visitor and family and drive the content of the visit.

Although very large samples ($n > 200$) are recommended to capture the full strength of SEM analyses (Hancock, 2006), samples over a minimum of 100 participants are considered acceptable (Schumacker & Lomax, 2004). The target sample of 121 family/child participants was therefore acceptable. Prior to analysis, normality of the data was investigated by examining

the symmetry (skewness) and flatness (kurtosis) of the distribution, as well as scatterplots of paired dependent variables (i.e., indicators of quantity and content, subscales of HVPS) and probability plots. Missing data and model identification (i.e., order and rank) were also examined prior to analysis. Specifically, in examining the order condition, the number of free parameters to be estimated must be less than or equal to the number of distinct values in the sample covariance matrix. The rank condition was algebraically determined by the AMOS software. Maximum Likelihood (ML) estimation was used to estimate model parameters.

Chi-square analyses were used to examine whether the proposed model is significantly different from the data. However, due to the nature of the chi square analysis, the test is often significant despite the model being a good fit to the data. Therefore, a range of fit indices were used to investigate the fit of the model to the data, including the comparative fit index (*CFI*), goodness-of-fit index (*GFI*), Tucker-Lewis index (*TLI*), and root-mean-square error of approximation (*RMSEA*). According to Hu and Bentler (1999), the recommended values of all listed indices, except *RMSEA*, is a value of at least 0.95, with values closer to 1 being preferable. *RMSEA* represents model error and therefore values less than or equal to 0.05 are recommended as being acceptable, with numbers closer to zero being preferable. However, previous research (Bentler & Bonett, 1980; Browne & Cudeck, 1993; Weston & Gore, 2006) has suggested that an *RMSEA* of 0.10 or lower, and other fit indices (i.e. *GFI*) of 0.90 are considered acceptable as well. Specifically, Weston and Gore (2006) indicates that less stringent criteria for fit indices are acceptable when using samples with less than 200 participants (as is in the current study). All significance levels were set at $p < 0.05$. Depending upon model fit criteria, decisions to modify the model were made based upon SEM requirements and conceptual fit with the literature.

Question 3. *How are local EHS family characteristics and demographic risk variables related to the empirically-validated constructs of home visiting integrity*? SEM, using maximum likelihood (ML) estimation method in AMOS (version 21.0), was conducted to examine the relationships between family characteristics and the empirically-validated latent constructs (i.e., quantity, quality, and content) of home visiting service delivery identified in the previous research question (See Figure 2).

This analysis was chosen because multiple regression analyses are able to be performed simultaneously depending on the relationships (including latent constructs) specified in the SEM model (See Figure 4). Finally, the paths (i.e., regression coefficients) between child/family characteristics and latent integrity constructs were examined to see if they were significantly greater than zero, $p < .05$.

Chapter 4: Results

Participants

A total of 121 children and families from a local Early Head Start (EHS) participated in the current study (see Table 1 for family demographics). As a regional program, EHS serves families with young children from birth to three-years of age in a mix of urban and rural communities located in Pennsylvania. Notably, over two-thirds of participants were Hispanic (68%) and more than half of the sample was bi-lingual (43%) or primarily Spanish-speaking (16%). Although 31% of caregivers reported having some college experience, 27% of caregivers reported completing high school as their highest degree of education. Forty percent of family participants did not earn a diploma or receive a GED. Furthermore, 41% of families were single-parent households. The average caregiver age was 26 years-old (range: 16-41). Children on average entered the program at 13 weeks-old and were 14 months at the time of assessment. Lastly, 6.6% of children were identified as having a disability and received services through an Individualized Family Service Plan (IFSP).

In looking at demographic variables that have historically been associated with decreased accessibility to services (i.e., "risk"), a demographic risk variable was calculated by recoding the current family characteristics (Kraemer et al., 1997). Families who were indicated as: (a) ethnic-minority status (e.g., Latino, African-American, Asian), (b) primarily non-English speaking (e.g., Spanish, other language), (c) single caregiver households (e.g., no spouse/partner or family member), (d) low education (e.g., less than a high school diploma/GED), or (e) having a child with a disability (e.g., child has IFSP) were given a positive endorsement (i.e., coded as 1) for each applicable category. The Demographic Risk variable is the sum of these five "risk" variables. Overall, 7% of the sample was identified as having zero risk variables. Nearly 20%

was identified as having one risk characteristic. However, the majority of participants were placed in two categories with 39.4% demonstrating two demographic risk factors and 28.2% demonstrating three demographic risk variables. Only 5.6% was identified in four risk variables. No families demonstrated all five characteristics.

Home Visiting Process Scale (HVPS)

 Exploratory factor analysis. EFA was undertaken to identify the underlying constructs of the newly-developed HVPS measure of home visiting quality. Prior to factor analysis, data were examined for skewness, kurtosis, missing items, and out of range values. Responses ranged from 1-5 ("Strongly Disagree----Strongly Agree"). Very few missing data were observed. One item ("Together my CDP and I decide what to do in the visit") was left blank for two respondents. No other item was missed more than once across the entire data set. Therefore, missing data were imputed by taking the linear trend of the data point in SPSS for these participants, who were missing less than 10% of the data at random (Rubin, 1987).

 In terms of data distribution, no items were skewed (see Table 2 for skewness and kurtosis values). However, three items demonstrated slight concerns with kurtosis (items 8, 9, 23) with values greater than the absolute value of 2. Since the distribution of the data did not meet assumptions regarding kurtosis, a linear transformation of these three items was completed for the purpose of EFA by taking the square root of item values. The transformations change the magnitude of the data values; however, they do not change the relative order of the values (Tabachnick & Fidell, 2007). Following linear transformation, the kurtosis of the items was within an acceptable range. Next, preliminary analyses were conducted and the following assumptions of exploratory factor analysis (Fabrigar, MacCallum, Wegener, & Strahan, 1999) were met: (a) adequate sample size per number of items (i.e., 23 items x 5 participants = 115; $n =$

120), (b) Bartlett's Test of Sphericity ($p < .001$), and (c) the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (i.e., KMO = 0.899).

A series of principal axis factoring analyses, examining both orthogonal and oblique rotations, were conducted to discern the most statistically-sound and meaningful factor structure for the HVPS. Each orthogonal and oblique solution was examined in terms of: (a) minimum of three items with appreciable loadings defined as .44 and above; (b) factor internal consistency $\geq$ .70; (c) minimal intercorrelation of unit-weighted factors; and (d) theoretical meaningfulness. As recommended by Stevens (2002), a conservative approach for setting the value for an appreciable loading in the current sample size ($n = 121$) was used. Stevens (2002) recommends testing each factor loading for significance at $\alpha = .01$. The critical value for a simple correlation closest to the current sample size provided by Stevens (2002) is .217 (pp. 394). However, Stevens (2002) recommends that critical values for a correlation coefficient ($\alpha = .01$) be doubled to test the significance of a loading. Accordingly, appreciable loadings were set to .44 and above ($>2(.217)$ for the current study. Furthermore, in order to determine the most parsimonious solution, items that double-loaded onto the factor solutions were removed, and the alpha values for the factor structures were re-evaluated with and without the double loading item. Factor solutions were examined to ensure that the factor structures were maintained and the alpha values did not fall below the recommended criteria of .70 without the double loading item.

A maximum of four possible factor solutions met the criterion of eigenvalues greater than one. In addition, the scree plot supported solutions up to four factors. Although oblique rotations were completed, 2-, 3-, and 4-factor solutions were unable to achieve greater than five percent variance for subsequent factors after the first (Gorsuch, 1983). See Table 3 for percent variance accounted for in oblique factor analyses. Also, due to the fact that the vast majority of items

(e.g., 22 out of 23 items) double loaded onto multiple factors, a simple parsimonious factor structure was unattainable in the oblique rotations. Similarly, despite that a 3-factor solution was initially proposed, analysis of the 3-factor orthogonal solution demonstrated that the third factor accounted for less than five percent of the overall variance. In addition, nine items double loaded on the 3-factor orthogonal solution, inhibiting interpretability. Furthermore, even though the theoretical meaningfulness of the 4-factor orthogonal solutions was promising, the 4-factor solution did not reach adequate internal consistency for all of its factors (i.e., Factor 4, three items, $\alpha = .67$). Therefore, the 4-factor solution was rejected in favor of a 2-factor structure as the most viable solution. The final solution consisted of a 2-factor orthogonal structure, accounting for 49.3% of the variance and containing a total of 19 items ($\alpha = .92$, $\alpha = .73$, respectively).

Overall, the 2-factor solution was found to be theoretically meaningful as the dimensions appear to capture the bi-directional nature of home visiting by reflecting the quality of home visiting services as delivered by home visitors (Factor 1: Delivery Quality) and the quality of family's response to the home visiting services they receive (Factor 2: Response Quality). Table 4 provides a complete list of all items and factor loadings for the final solution. The items with the strongest loadings on Delivery Quality were "CDP genuinely cares about my child and family," "CDP provides me with encouragement and makes me feel more confident," and "We are excited to have our EHS visit." On Response Quality, the highest loading items were "I take the lead with activities during the visit" and "CDP and I problem solve by breaking down problems into smaller steps." The interfactor correlation between Delivery Quality and Response Quality ($r = .58$, $p < .001$) was higher than expected, but acceptable given the transactional nature of home visiting services. Lastly, Table 5 presents the non-loading and double loading items that were removed from subsequent analysis in the current study. Removal of the double

loading items did not significantly reduce the internal consistency of the factors; therefore, double loaders were eliminated to maintain parsimony. However, it should be noted that double loading items may represent collaboration between home visitor and parent. (This began to emerge in the 4-factor orthogonal solution). Therefore, future exploration of the HVPS with larger samples will retain all items developed from focus groups for further scaling and analysis.

Measurement stability. In order to assess the temporal stability of the newly developed HVPS, twenty-five percent of the scale development sample ($n = 28$) were randomly selected and matched according to caregiver ethnicity and language (i.e., HVPS completed in English or Spanish) for a second administration 4-6 weeks later. Pearson correlations conducted on factor scores across the two time points were $r = .41$, $p = .035$ for Delivery Quality and $r = .37$, $p = .056$ for Response Quality. However, means and standard deviations of HVPS scores (see Table 6) were highly similar across the two assessment points. During the initial pilot of the measure, average scores for Delivery Quality and Response Quality were 65.28 and 21.23, respectively. At the reliability assessment the mean for Delivery Quality was 65.19 and the mean for Response Quality was 20.75.

Service Delivery Indicators

Descriptive analysis of quantity indicators (see Table 7) demonstrated that participants on average had a total of 44 home visits. The intensity of visiting was roughly one visit per week, and the average duration in weeks in the program was approximately one year (mean: 52, range: 1-124) at the time of assessment. Overall, participants rated the quality of both services delivered (mean: 65, range: 53-70) and the response to services (mean: 21, range: 14-25) as high. Although scores were normally distributed for each of the quality indicators, both indicators appear slightly skewed towards a positive rating. In terms of home visiting content, the total number of goals

across the major content categories of child development (mean: 83, range: 4-220), child health (mean: 103, range: 4-257), and family support (mean = 125, range: 6-335), were numerous with large ranges and standard deviations within each area.

In examining bivariate correlations of the service delivery indicators (see Table 8), significant correlations were found for most variables within each construct of quantity, quality, and content. That is, number of home visits was significantly correlated with duration of time spent in the program. Delivery Quality and Response Quality were found to have a moderate correlation with each other ($r = 0.61$). In regards to content variables, all of the total goals for child development, child health, and family-focused content areas were significantly correlated with each other. Interestingly, fewer significant correlations were found across construct areas (i.e., quantity, quality, content). For example, only number of home visits and duration in the program were significantly correlated to the numbers of child development, child health, and family support goals. Significant correlations were not identified between quality indicators and other construct indicators.

SEM Analyses

Quantity, quality, content (Model 1). Using AMOS software version 21.0 (Arbuckle, 2012), Structural Equation Modeling was the primary method of examining whether the proposed integrity model of quantity, quality, and content by Raikes et al. (2006) fits the current sample data. SEM is the appropriate method of data analysis as it is a statistical technique for testing and estimating relationships that uses a combination of statistical data and qualitative causal assumptions (Schumacker & Lomax, 2004).

The proposed model includes three latent variables (i.e., Quantity, Quality, Content) with each of their corresponding indicator variables demonstrated in Figure 2. The latent variable of

Quantity represents how much home visiting a family receives and is measured by (a) the total actual number of visits received, (b) the duration (in weeks) the family has been enrolled in the program, and (c) the intensity of service provision (the percentage of visits completed that were prescribed). Quality represents the active and passive qualities of home visiting services and is measured by the subscales of the HVPS- Delivery Quality and Response Quality. Lastly, the latent variable of Content represents the focus of the visiting and is measured by (a) the total number of child development goals, (b) the total number of child health/nutrition goals, and (c) the total number of family support goals.

Prior to modeling analysis, the normality of the data was found to be acceptable by examining the symmetry (i.e., skewness) and flatness (i.e., kurtosis) of the distribution, as well as scatter plots of paired dependent variables (i.e., indicators of quantity, content, subscales of HVPS) and probability plots (Curran, West, & Finch, 1996). Missing data and model identification (i.e., order and rank) were also examined prior to analysis. The model met criteria for identification, having sufficient number of sample moments for the number of parameters to be estimated. In specifying the model, latent variances were set to 1 to allow for the estimation of the loadings of all exogenous indicators. Maximum Likelihood (ML) was used to estimate model parameters. All analyses were performed on the variance-covariance matrix.

Although the chi square test for the original model was significant (χ^2 (32) = 62.37, $p <$ .001), 7 out of 8 exogenous indicators were significant predicted by their corresponding latent variables (see Table 9 for estimates). Only intensity of home visiting was not significantly predicted by its corresponding latent variable, Quantity. Unstandardized loading estimates ranged from -0.51 to 35.23 for Quantity, 2.36 to 4.61 for Quality, and 62.49 to 88.50 for Content. More specifically, the total number of home visits emerged as the strongest indicator of Quantity,

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while Response Quality was found to be the strongest indicator of Quality. The number of child health goals was demonstrated to be the strongest indicator of Content. Furthermore, only the latent constructs of Quantity and Content were significantly correlated ($p < 0.001$) with each other (see covariances in Table 10).

A range of fit indices (Browne & Cudeck, 1993; Hu & Bentler, 1999; Weston & Gore, 2006) were used to investigate the fit of the original model to the data, including the normed fit index (*NFI*), incremental fit index (*IFI*), Tucker-Lewis index (*TLI*), comparative fit index (*CFI*), and root-mean-square error of approximation (*RMSEA*). The original model demonstrated acceptable fit in 4 out of 5 indices (*NFI* = .92, *IFI* = .96, *TLI* =.93, *CFI* = .96) and improper fit on one index (*RMSEA* = .12).

Modified model (Model 2). Model modification indices were unavailable due to incomplete data across Quantity and Content indicators. However, considering the high multi-collinearity and linear dependency between intensity and the other quantity variables, intensity was removed as an indicator. The modified model was tested again according to the procedures and fit indices identified above (see Figure 3).

The chi square test for the modified model was not significant (χ^2 (24) = 33.40, p = .09, *n.s.*), suggesting that there is not a significant amount of difference between the modified model and the actual model. All seven exogenous indicators were again significant predicted by their corresponding latent variables (see Table 11 for loadings). Loading estimates ranged from 31.27-35.18 for Quantity, 2.36- 4.62 for Quality, and 62.49- 88.51 for Content. Consistent with results from the original model, total number of home visits emerged as the strongest indicator of Quantity, Response Quality was the strongest indicator of Quality, and number of child health goals for Content. Again, only the latent constructs of Quantity and Content were found to be

significantly correlated ($r = .95$, $p < .0001$) (see covariances in Table 12). The same fit indices used in the prior model were again inspected to investigate the fit of the model to the data. The modified model demonstrated good fit in 4 out of 5 indices (*NFI* = .95, *IFI* = .99, *TLI* = .93, *CFI* = .99) and acceptable fit for one index (*RMSEA* = .08).

   Full SEM model (Model 3). Next, SEM using maximum likelihood (ML) estimation method in AMOS (version 21.0) was conducted to examine the relationships between family characteristics and the empirically-validated latent constructs (i.e., Quantity, Quality, and Content) of home visiting service delivery (see Figure 4) identified in the previous analysis. The chi square analysis was significant (χ^2 (42) = 66.46, $p < .01$). However, the full model demonstrated good fit (*IFI* = .97, *CFI* = .97) or acceptable fit (*NFI* = .92, *TLI* = .94, *RMSEA* = .07) across all five indices. All endogenous indicators remained significantly associated with their corresponding latent variables (all p's < .005) as identified in the modified measurement model. In terms of demographic predictors, only three significant relationships were identified. Child age at enrollment significantly predicted Quantity ($b = -0.51$, $p < .001$) and Content ($b = -1.26$, $p < .001$), indicating that younger child age was associated with higher quantities of home visiting and higher numbers of content goals. Interestingly, demographic risk predicted only one latent construct, Quality ($b = -1.47$, $p = 0.005$). Greater indication of demographic risk was associated with lower parent-rated quality of home visiting.

Chapter 5: Discussion

Home visiting is a method of service delivery used to provide services to over a quarter million of children in the U.S. (Raikes et al., 2006). Not surprisingly, there is significant variation in child and family outcomes for home visiting participants as intervention services and family experiences vary greatly within and across different programs (Kormacher et al., 2007; Sweet & Applebaum, 2004). However prior home visiting evaluation research has often neglected integrity assessments, leaving researchers with little understanding of how home visiting strategies are connected to child and family outcomes (Korfmacher, 2006, Perepletchikova & Kazdin, 2005). Although some evaluations have broadly examined attrition or service dosage, these studies provide little understanding of program quality and modest indication as to why results, in addition to family participation and engagement, were not achieved (Kormacher et al., 2007; Raikes et al., 2006).

Raikes and colleagues (2006), however, propose a tri-fold model of home visiting integrity (i.e., quantity, quality, content) to assess *under what conditions* home visiting is effective and *how* are these components delivered to culturally-diverse families. By thoroughly assessing salient components of home visiting identified by Raikes and colleagues (2006), the current large scale evaluation of an ethnically-diverse, regional Early Head Start program is equipped to enable researchers to further understand the variation in family experiences and participation in the program. Specifically, the present study was completed to understand quality more thoroughly as a component of home visiting services, to assess a multidimensional model of home visiting integrity, and to comprehensively evaluate local service delivery for culturally-diverse families at-risk.

Examination of the Home Visiting Process Scale

In order to empirically examine the home visiting model identified by Raikes et al. (2006) and to comprehensively evaluate service delivery for local families at-risk, it was first necessary to develop a parent-reported assessment of home visiting quality. The family perspective of quality is particularly important because the relationship between the family and the provider is often described as the mechanism for change (Korfmacher et al., 2007). The parent perspective has often been ignored in the early childhood literature (Korfmacher et al., 2007), despite that client report of the therapeutic relationship has been found to be a key predictor of outcomes in the psychotherapy literature (Horvath, 2000).

Largely informed by the work of Roggman et al. (2001) and Korfmacher et al. (2007/2008), the current work rigorously examined the construct of home visiting quality, utilizing rich qualitative and quantitative psychometric methods through a partnership with local families, program staff, and researchers. Although a three-factor solution was originally hypothesized to represent multiple dimensions of home visiting quality discussed throughout the literature, including a) home visitor competency, b) family engagement, and c) the home visitor-family relationship (Baker et al., 1998, Brookes et al., 2006, Korfmacher et al., 2008, Roggman et al., 2001; Sharp et al., 2003), EFA identified a simpler, more parsimonious two-factor solution. The first factor demonstrates the ways in which EHS home visitors provide emotional support, deliver activities/materials that are specific to the child's/family's needs, and incorporate the whole family/culture into the visit (13 items, $\alpha = .92$). The second factor demonstrates the ways in which families actively respond to visitors and session materials by taking initiative, using problem solving, and making observations outside the home visit (5 items, $\alpha = .73$). Therefore, the factors were respectively named Delivery Quality and Response

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Quality to represent the passive and active nature of home visiting services. These two factors correspond with previous literature suggesting features of the home visit (e.g., Delivery Quality) and family participation (e.g., Response Quality) are important aspects of home visiting quality (Korfmacher et al., 2008; Roggman et al., 2001). However, in the present sample, the items designed to assess the hypothesized dimension of the visitor-family relationship (Brookes et al., 2006; Sharp et al., 2003) were not able to be distinguished separately from the dimensions of Delivery Quality and Response Quality[1].

These results are similar to the results found in prior research psychometrically-examining the dimensions of home visiting quality (Korfmacher et al., 2007; Roggman et al., 2001). Roggman et al. (2001) found high internal consistency for the theoretically (or conceptually)-derived two parent-report scales used to evaluate quality of home visits and relationship with the visitor. However, in previous research with the Helper-Client Relationship Inventory (Kormacher et al., 2007), factor analysis identified only one distinct factor representing the quality of the relationship between the home visitor and family. Korfmacher et al. (2007) stated that while a two-factor solution was considered at the 6-month and 15-month assessments, the second potential factor had too few items and did not meet criteria for internal consistency. These results highlight the difficulty of teasing out aspects of quality that are likely highly interrelated due to the intimate nature of home visiting.

The Delivery Quality and Response Quality factors in the HVPS demonstrated moderate-to-high inter-factor correlation ($r = .58$). Roggman et al. (2001) also found that parent assessments of quality were correlated with each other ($r = .70$). Reports of quality were also

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[1] Of note, eigenvalues >1 prompted the consideration of a four-factor solution for the HVPS. In this solution dimensions appeared to represent a) home visit features, b) home visitor-family relationship, c) visitor-led family engagement, and d) family-initiated engagement. However, weak internal consistency and too few items for the fourth factor prohibited the acceptance of this solution.

significantly associated across raters in some aspects. For example, Roggman et al. (2001) found parent-rated quality of the home visit to be significantly correlated with global ratings of the visitor-family relationship completed by staff. No other staff or researcher ratings of quality were associated with parent report. Together, these studies emphasize parent report of quality as an important and unique contribution necessary to fully understanding home visiting service delivery. However, it also highlights the need to assess and compare multiple measures of home visiting quality within an evaluation, as parent-rated quality of home visits is limited to their own personal experience.

Furthermore, consistent with prior research examining the stability of home visiting quality over time (Kormacher et al., 2007), the HVPS factors demonstrated minimal stability across a period of a few months ($r = .41$ and $r = .37$). However, HVPS means and standard deviations were highly similar across time points. This seemingly contradiction may represent high quality service provision across multiple families by home visitors (high means overall), but also the fluctuations within families that are a result of situational factors (Bracaliello et al., 2008) that low-income families encounter and inhibit parent-reported quality (i.e., Families likely present with different needs at different points in time, but service quality provided by the home visitor is on average high across families). Korfmacher et al. (2007) previously also found a significant, but weak correlation using the HCRI to measure the home visitor-family relationship at 6 and 26 month assessments ($r= .17$). These results suggest that parent-rated home visiting quality is a dynamic construct that varies and changes across time for each family.

Overall, HVPS ratings tended to be positively skewed, as often is the case in research with parent raters of service provision (Korfmacher et al., 2007; Roggman et al., 2001). Yet, HVPS ratings were normally-distributed despite the tendency for parents to rate the quality as

high. The descriptive mean ratings were high for both Delivery Quality (mean= 65, range= 53-70) and Response Quality (21, range= 14-25), although variation is evident in the standard deviations of the factors. It has been speculated that families receiving support through services that are provided at no cost to them often rate service providers highly on formal measures; although more variable reports have been observed in qualitative interview formats (Kormacher et al., 2007). However, the current study used partnership-based methods to qualitatively explore the rich construct of quality through iterations of focus groups and dialogue between program families, staff, and researchers. The normal distribution and variation of scores found in the present study are likely a result of the item content developed through the partnership process. Furthermore, the results indicate the promise of using parent-report questionnaires as an acceptable method of assessing home visiting quality.

Discussion of Quantity, Quality, and Content model

Next, after psychometrically investigating the construct of home visiting quality, the current research sought to empirically test the tri-fold model of Raikes et al. (2006), which identifies quantity, quality, and content as key components of home visiting service delivery. Prior home visiting research has often evaluated integrity through traditional dosage assessments (Baker et al., 1998; Culp et al., 2004) and in comparison to broad performance standards (Love et al., 2005, Wagner & Clayton, 1999). Instead, the current research extends the integrity model of quantity, quality, and content, proposed by Raikes and colleagues (2006) in assessing multiple aspects of both the delivery and reception of home visiting services (Power et al., 2005).

Indeed, the current work confirmed Quantity, Quality, and Content (Raikes et al., 2006) as distinct components that are interconnected and represent a comprehensive evaluation model of service delivery. The SEM analyses demonstrated good fit for the modified measurement

model (Model 2) across numerous tests, including four fit indices and a non-significant Chi square analysis. The results suggest that there were no significant differences between the proposed model of latent constructs (i.e., Quantity, Quality, and Content) and the observed indicators selected to measure home visiting integrity. Therefore, the model of quality, quantity, and content is an accurate and comprehensive way to capture home visiting service delivery. Although specific measurement indicators may vary across studies, home visiting research should aim to address each of these components in completing evaluations.

In the present analyses, the relative strength of measurement indicators was also able to be examined. Of the measurement indicators in the current study, number of home visits received, Response Quality, and number of child health goals emerged as the strongest indicators of Quantity, Quality, and Content, respectively. However, the relative "strength" of these indicators is minimal compared with the values provided for indicators in each of these constructs. Future research should continue to include multiple indicators to determine whether specific home visiting variables demonstrate increasing relative strength and value.

Moreover, the present analysis allowed for the simultaneous examination of the relationships between the three latent constructs. Whereas previous research has identified correlations between pairs of service delivery variables, the current work is able to represent latent variables through these indicators and to identify concurrent relationships between all three latent variables through the SEM model. In doing so, a strong correlation was found between the latent constructs of Quantity and Content. In examining specific relationships between quantity and content variables, number of home visits was found to be significantly correlated with the number of goals in all content areas. In previous research (Raikes et al., 2006), content was found to be independent from other components. The current connection is likely due to the fact

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that measurement of Content (i.e., number of goals) was prescribed to increase with each home visit. (Percentages of content focus (i.e., goals/visits) are an alternative way to measure content; however, due to their linear dependency with the construct of Quantity in the current study, they were unable to be used as indicators in the SEM.)

Interestingly, little association was found between Quantity and Quality, suggesting that the dimensions of quality examined here (i.e., Delivery Quality and Response Quality) vary independently from the amount of home visits or duration of time spent in the program. Quality was established as its own unique dimension of integrity, well-fitted within the model yet distinct from the other latent constructs. Quality, therefore, is a vital component in home visiting evaluations that should be targeted for assessment and adequately assessed rather than depending solely on measures of quantity to evaluate family experiences.

Prior research has identified stronger connections between quantity and *staff-reported* quality of services (Green et al., 2004; Korfmacher et al., 2007; Raikes et al., 2006; Rector, 2002). Raikes et al. (2006) found that global ratings of quality by staff correlated with number of completed home visits, intensity, and most strongly duration in the program ($r=.41$). However, the mean rating of quality assessed in individual sessions was only weakly correlated to duration ($r=.13$). The association between global staff ratings and quantity may reflect potential bias due to the increased contact. However, the finding that specific quality within session was only weakly related to duration in the program is more similar to the results found in the present study. Although global ratings are useful for describing overall impressions, they are but one source of information and may not accurately capture the quality occurring within sessions.

The findings presented here may differ from past research (Raikes et al., 2006) due to the difference in raters. Parent perspective of quality has shown less connection with other service delivery variables than staff report (Korfmacher et al., 2007). For example, Korfmacher and colleagues (2007) found quality of the home visitor-family relationship, measured by the HCRI, significantly predicted number of home visits and staff-rated engagement at 6 months. Scores on the HCRI continued to predict these quantity variables as well as duration at 26 months. Interestingly, quality was not associated with any participation or involvement variables at the 15 month assessment. In the current study families were only in the program for approximately one year (i.e., 52 weeks) at the time of assessment. The results of these two studies raise the question as to whether there is something unique about the relationship between parent-rated quality and quantity of home visiting at 12 months.

However, alternative explanations include situational factors that may mediate or moderate the relationship between Quantity and Quality variables. For example, the environmental stressors that families living in extreme poverty face may prohibit families from fully engaging in home visiting services, despite the service being routinely provided to them on a weekly basis (Bracaliello et al., 2008). Other potential mediators include characteristics of the home visitor, such as years of experience, similarity of life experiences, or cultural match between family and visitor (Brookes et al., 2006; Sharp et al., 2003). Regardless, the collective findings emphasize the importance of including the parent perspective of quality. Furthermore, assessments of parent-rated quality would ideally occur across multiple time points to capture the dynamic changes within this construct.

Discussion of service delivery in relation to demographic risk

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In answering the third and final research question, the current study sought to evaluate the delivery of the empirically-validated home visiting components in the local EHS program according demographic variables, in particular demographic risk. The current study represents one of a few studies examining family demographics in relation to quantity, quality, and content components of home visiting integrity. In this way, the present body of home visiting integrity is in its infancy, particularly in regards to measurement (Kormacher et al., 2007). Consistencies, as well as variations, from the previous literature are described below. However, comparisons between the results of the present study and prior research are difficult due to differences in measurement of quality and content variables, as well as variations in statistical approach and analyses, in this small body of literature.

Quantity and content of home visiting. Overall, similar to prior literature (Raikes et al., 2006), demographic differences varied across the three integrity components of quantity, quality, and content. Although sample subgroups (i.e., Latino, African-American, Caucasian) were too small in the current evaluation of the local EHS program to compare demographic differences, Raikes and colleagues (2006) found that quantity of visitation and percent of child content differed in terms of race/ethnicity. However, within the present study, only one of the three demographic variables examined (i.e., maternal age, child age, demographic risk) emerged as a demographic predictor. Results in the current study found child age to be a significant predictor of the latent variables, Quantity and Content. Not surprisingly, children who entered the program at a younger age were able to receive greater Quantity of home visiting (i.e., number of home visits and duration of program together) and had more Content goals recorded across all content areas. Future qualitative research with home visitors and families, in addition to quantitative

studies, should continue to explore the process of goal setting and content of home visiting in EHS.

Quality of home visiting. Moreover, in examining quality of home visiting services, an index of demographic risk predicted the latent variable of Quality (i.e., Delivery Quality and Response Quality together). Families with increasing levels of demographic risk reported lower ratings of quality for the home visiting provided and their own engagement in services. It appears that low-income families experiencing multiple risks related to low education, little social support, or difficulties communicating in their native language may encounter barriers that make full engagement in home visiting services challenging. This finding is particularly interesting given the lack of insight prior research has provided when examining the process of home visiting for high-risk families (Duggan et al., 2000; Fergusson et al., 2005). Rather, the current finding directs researchers and program staff to target and measure quality of services for families with increasing demographic risk. However, in terms of prior research, studies have found little connection between parent-reported quality of home visiting and family variables. Roggman et al. (2001) found that although global ratings of quality reported by staff were correlated with family functioning and improvement scales, parent report of quality was not significantly associated with family demographic variables. Similarly, Korfmacher et al. (2007) found that caregiver-reported quality of relationship measured on the HCRI did not vary by ethnicity. Local satisfaction measures, however, were higher for English-speaking families, possibly indicating the challenge programs may have serving families in their native languages (Korfmacher et al., 2007).

Overall, the findings in the literature are mixed as to how home visiting components, particularly quality of services, are related to family demographic and risk variables. However,

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this remains to be an extremely valuable and pertinent question as home visiting programs often experience significant levels of non-completion. Given the current results, demographic risk is associated with lower levels of parent-reported quality, which likely reflects the exponential challenges families with multiple risks face when attempting to engage in services. Although beyond the scope of the present study, the findings also raise the question as to whether lower quality (i.e., higher risk) would be associated with program non-completion. Fergusson et al. (2005), for example, reported that 65% of high-risk families were participating in home visiting services at 24 months and only 59% participated for the intended 36 months of the program. Duggan et al. (2000) also reported high attrition rates with 49% of high-risk families still involved in treatment at 12 months. Duggan and colleagues (2000) stated that "refusal" of services was the most common reason families ended treatment, likely "before home visitors had many opportunities to establish rapport."

When culturally-diverse, high-risk families receive home visiting services for the duration of time intended, there appears to be significant benefits for children (Raikes et al., 2006; Wagner & Clayton, 1999). Previous research has demonstrated home visiting programs to be an effective method of promoting multiple aspects of cognitive development, particularly for children of Spanish-speaking, Latino mothers, when families completed the programs (Wagner & Clayton, 1999). These effects are often seen for families who are able to *complete* the program. However, prior research has provided little insight into whys some families were unable to complete the program. Although not designed to evaluate attrition, the current study identifies a clear connection between high levels of demographic risk factors and lower levels of parent-reported quality. By highlighting this target, local program staff and families can identify

and discuss strategies to promote the successful delivery and tailoring of high-quality home visiting services for families with multiple demographic risk factors.

Limitations

A number of limitations hinder the internal and external validity of the present study. First, the sample size for the SEM models is small. Although initial sample size ($n = 121$) met minimal requirements, a number of participants' archived data files were unavailable due to children's transition or exit from the program. SEM is able to account for missing data, however, much larger samples are generally recommended.

Moreover, there are a number of measurement concerns in using the HVPS. The parent-reported HVPS was the only measure used to examine home visiting quality. Although families were able to provide information on their unique experience with home visiting, they are unable to consider the breadth of home visiting experiences that occur across families. Furthermore, following EFA, it was reported that the HVPS 2-factor orthogonal solution accounted for only 49% of the variance in the sample data. This finding indicates that large portions of the data remain unexplained and unaccounted for by the HVPS. Also, there are concerns with the temporal stability of the measure. Although comparable means and standard deviations for the HVPS factors were found across time, correlations were low to moderate. Low stability could also be due to parents reflecting on the most recent home visit (i.e., immediacy effect), as there were not clear instructions for parents to consider their entire experience with home visiting when rating quality of services. Although undesirable, the low temporal stability could also reflect measurement error in the ability of the HVPS to reliably capture quality of home visiting services over time, regardless of situational factors the family may be experiencing. In addition, the current assessment of home visiting quality did not test the predictive validity of the HVPS.

Without doing so, the HVPS is unable to legitimize and distinguish itself from prior measurement tools.

Furthermore, the measurement of home visiting content was rudimentary. Measurement of this construct was limited to the tallied number of child development, child health, and family-focused goals the home visitors recorded in the weekly session logs. These data do not reflect the actual time within the session spent in these respective areas. They merely provide an estimate of the attention prescribed to a broad content area in home visiting. Furthermore, due to the recording of goals at each and every home visit, there is subsequently a high correlation between measures of content and measures of home visiting quantity. This is a major limitation as Quantity and Content were consequently highly correlated in SEM analyses; therefore, the true interrelationships between Quantity, Quality, and Content variables are less distinguishable.

Limitations in the methods of analysis warrant attention as well. The high correlation between Quantity and Content variables is also a limitation in the SEM analyses due to the implicit linear dependency between quantity and content variables. This information was unknown to the researchers prior to analysis. Future analysis will look to control for the number of visits when examining Content and use duration in the program as the primary method of assessing Quantity. In addition, analysis of Quality in the SEM measurement model is somewhat biased, as the same participants used to evaluate the factor structure of the HVPS were again used in the SEM analysis. However, these limitations should not take away from the findings related to the construct of Quality and demographic risk. Lastly, analyses were unable to control for the nesting effects of home visitor. Each of the families had one of the sixteen program visitors with varying levels of experience and training, likely impacting service provision across

integrity areas. Therefore, the current study was unable to control for ratings of quality that may be particular to specific visitor characteristics.

Implications and directions for future research

Overall, the current work extended home visiting evaluation research by using a psychometrically-validated measure of quality of services within a comprehensive, empirically-supported framework of quantity, quality, and content to assess service delivery for culturally-diverse and at-risk families in EHS. Specifically, the study demonstrated that a psychometrically-promising measure of parent-rated quality could be developed through partnership-based research methods. Although the parent perspective has not previously been addressed in the literature, preliminary development and evaluation of the HVPS indicates its promise as a measure that uniquely captures the parent perspective of quality. Furthermore, the results of a scale developed through partnership-based methods demonstrate the variation that can occur within this construct and potential utility of a parent-reported measure. The HVPS is therefore a valuable tool that can be used in conjunction with other methods to examine home visiting quality.

Logical next steps include a continued examination of the construct of home visiting quality. Future research should further explore the multiple dimensions of quality across large samples to determine if the structure is maintained across different demographic groups and regions. In particular, Response Quality emerged as a small, but meaningful subscale of family engagement on the HVPS. A four-factor solution, considering two types of family engagement, was examined as a potentially viable solution, but the fourth factor (i.e., family-initiated engagement) was unable to reach internal consistency with only three items. Future studies should continue to investigate home visiting quality through the use of rich, qualitative studies to

explore the multiple dimensions of this construct. Furthermore, item response theory (IRT) methods could be employed to further illustrate the range of item content and construct representation. For example, IRT analyses can identify how likely it is that specific items will be endorsed and therefore used to create a scale with a normal distribution and less positive skew.

In using advanced SEM methods, the findings presented here empirically-validate the tri-fold model of quantity, quality, and content (Raikes et al., 2006). In confirming this conceptual framework, the results emphasize the need for home visiting evaluations to include indicators for each of the three integrity components. In particular, quality of home visiting cannot be overlooked. Quality was demonstrated to be a unique component of home visiting, unrelated to Quantity or Content, but well-fitted within the overall model of integrity. Therefore, it is insufficient to infer quality of home visiting based upon measures of quantity of participation (i.e., number of visits, duration in the program, attrition status, etc.). Future evaluations should also strive to collect multiple assessments of quality over time, as it appears to be a potentially dynamic construct. Furthermore, future studies should consider the inclusion of situational factors (e.g., family stress, home visitor characteristics) that may mediate or moderate the relationship of quantity and quality.

In addition to assessing all three integrity components, future studies should examine the *full* range of service delivery and reception indicators identified in the joint model of Raikes and Power (see Figure 1). Specifically, one direction will be to develop the measurement of content variables in a readily accessible, feasible manner. This was attempted in the present study by examining content goals self-reported by home visitors on session logs. However, content was unable to be appropriately distinguished from measures of quantity due to the recording of goals at each and every home visit. The goals reported by the home visitor may not be the most useful

way to capture this critical construct. Rather, in partnership with program administrators, home visitors, and families, researchers should examine alternative methods of assessing content in a quick and efficient way. Ultimately, by assessing the integrity components of quantity, quality, and content in a readily feasible manner, program supervisors and staff will be able to review and monitor the data in systematic fashion to promote high-quality service delivery.

Moreover, the research presented here provides a foundational framework for evaluating home visiting service integrity, necessary in order to answer policy-pertinent questions related to child and family outcomes. The intended use of this comprehensive model in evaluations is to identify targets for program modifications, to enhance service delivery, and subsequently to promote positive child and family outcomes for all participants. For example, the present work identified child and family characteristics to be significant predictors of service delivery within a sample of low-income families. In particular, a family's level of demographic risk was associated with lower levels of parent-rated delivery of and response to home visiting services. A direct implication would be to target quality of services for families with multiple demographic risk factors (e.g., single-parent families, less than high school education) and use problem-solving to identify strategies to promote service quality for these families. Although home visiting services are designed to be individually tailored to meet families' needs, the process as to how this is done has not been elucidated. Future studies should reflect and examine how high-risk families are identified (e.g., demographics, risk scales) and how strategies are systematically implemented to promote effective service delivery and child and family outcomes.

This is valuable information as many participants with multiple risk factors are often unable to complete the prescribed duration of home visiting (Duggan et al., 2000; Wagner & Clayton, 1999). Although it was beyond the scope of the current study, further analysis of this

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model should examine whether families with lower levels of parent-reported quality are indeed more likely to discontinue services. Furthermore, despite that the current sample was unable to compare specific demographic groups, the full model should be replicated and examined in further detail with adequate samples of culturally-diverse groups in future research. Finally, in extending the current research, this model of integrity assessment will enable researchers to identify the vital connections between EHS home visiting components and child/family outcomes.

This research comes at a critical point in time, as the Obama administration has recognized the importance of home visiting programs as a national priority. The Maternal, Infant, and Early Childhood Home Visiting (MIECHV) initiative authorized through the Affordable Care act (2010) is designed to strengthen, coordinate, and promote comprehensive home visiting services for at-risk families. Over the next 7 years, the Obama administration is to provide $8.6 million dollars to fund "evidence-based" home visiting for low-income families (National Association of Child Care Resource and Referral Agencies, 2009). In thoroughly investigating the implementation of integrity components and service delivery, researchers can appropriately evaluate the effectiveness of specific home visiting interventions and program modifications. Overall, high-quality evaluations of home visiting will enable policy makers to make informed decisions and to direct policies that will support evidenced-based early childhood services for EHS families.

Table 1

Family Demographics

Demographic	Percentages, Means, Ranges
Caregiver ethnicity	68% Hispanic, 13% Black, 10% White, 7% Bi-racial, 1% Asian
Primary language	37% English, 16% Spanish, 30% Bilingual (English primary), 13% Bilingual (Spanish primary), 1% Other
Caregiver education	40% Below HS, 27% HS grad, 31% Some college, 1% College degree
Family household	41% Single-parent, 39% Two-parent, 20% Single-parent with partner
Caregiver age	M: 26 yrs old, R: 16-41 years old, 42% under 25 years old, 5% current teen mothers
Child age at assessment	M: 14 months, R: 6 months (prenatal)-28 months
Child age at enrollment	M: 13 weeks, R: 6 weeks (prenatal)- 27 months
Child disability status	6.6% receive services through an IFSP

Table 2

Skewness and Kurtosis Values for HVPS Items

Item	Skewness	Kurtosis
1	-1.33	-0.23
2	-1.25	0.45
3	-1.17	-0.64
4	-1.24	1.14
5	-0.77	-0.32
6	-1.35	0.77
7	-1.24	0.55
8	*-1.93*	*6.16*
9	*-1.74*	*3.49*
10	-0.84	-0.52
11	0.08	-0.89
12	-0.67	-0.72
13	-0.85	-0.49
14	-0.99	-0.29
15	-0.93	-0.61
16	-1.33	0.83
17	-1.46	1.13
18	-1.49	1.01
19	-1.15	0.18
20	-0.98	0.56
21	-1.41	0.94
22	-1.15	0.52
23	*-1.89*	*3.38*

Notes. n = 121. Italicized items indicate non-normal distribution

Table 3

Percent Variance Accounted for by Each Factor in Oblique Solutions

	Percent variance by factor			
	1	2	3	4
2-Factor solution	43.7	4.4	n/a	n/a
3-Factor solution	43.9	4.7	3.5	n/a
4-Factor solution	44.0	4.8	3.7	3.2

Table 4

Factor Loadings for Dimensions of the HVPS

Item content by factor	Factor loadings*
Delivery Quality: (14 items, α = .92)	
CDP genuinely cares	.83
CDP provides encouragement	.73
Family is excited for visit	.73
CDP is respectful of culture	.72
CDP is interested in family	.71
CDP and family interacting during the visit	.69
CDP shares information about child development	.66
Activities are specific to child/family	.61
CDP is consistent/dependable	.60
Questions about child development, etc.	.59
CDP and family plan visit	.57
Comfortable sharing concerns	.51
CDP incorporates whole family	.51
Program provided in appropriate language	.49
Response Quality: (5 items, α = .73)	
Caregiver takes the lead with visit	.64
Caregiver & CDP problem solve	.61
Family is ready to start visit	.55
CDP helps with big family goals	.49
Caregiver observes child's progress outside visit	.49

Notes. n = 121. *Entries are varimax rotated loadings.
Appreciable loading set to .44

Table 5

Non-loading and Double Loading Items

Item	Factor 1 loading	Factor 2 loading
7. CDP connects me with community resources	0.52	0.53
16. During visits we monitor child's progress	0.52	0.56
19. My CDP involves me in play/teaching	0.58	0.56
20. I complete my weekly assignments after visit	0.42	0.29

Notes. n = 121. *Entries are varimax rotated loadings.
Appreciable loading set to .44

Table 6

Means and Standard Deviations for HVPS Factor Scores

	Factor 1:Delivery Quality		Factor 2: Response Quality	
Assessment time	Mean	Std. Dev.	Mean	Std. Dev.
Initial scaling ($n = 121$)	65.28	5.32	21.23	2.63
Reliability ($n = 28$)	65.19	5.27	20.75	4.51

Table 7

Descriptives of Service Delivery Indicators

	Mean	Std. Dev.	Range
Quantity			
Total number of home visits	43.6	31.7	2-103
Intensity (visits/week)	0.89	0.31	0.43-3.00
Duration in program (weeks)	51.6	36.6	1-124
Quality			
HVPS- Delivery quality	65.3	5.3	53-70
HVPS- Response quality	21.2	2.6	14-25
Content			
Child development goals	82.8	64.5	4-220
Child health goals	102.8	77.5	4-257
Family support goals	124.7	92.2	6-335

Tables 8

Bivariate Correlations

		1	2	3	4	5	6	7	8
1	Number of home visits	1							
2	Intensity	-0.13	1						
3	Duration	0.97**	-0.21	1					
4	Delivery quality	0.04	-0.08	0.01	1				
5	Response quality	0.22	-0.13	0.19	.61**	1			
6	Child development goals	0.93**	-0.11	0.90**	0.01	0.20	1		
7	Child health goals	0.93**	-0.14	0.92**	0.01	0.16	0.96**	1	
8	Family support goals	0.91**	-0.11	0.89**	0.05	0.20	0.94**	0.95**	1

Table 9

Indicator Estimates and Corresponding Latent Variables for the Original Model

	Regression weights					
	Quantity		Quality		Content	
Indicator	β	b	β	b	β	b
Total number of home visits	.99	31.23**				
Duration in program	.98	35.23**				
Intensity of visiting	-.17	-0.05				
Delivery quality			.74	4.03**		
Delivery quality 2 (RA)			.78	4.61**		
Response quality			.84	2.36**		
Response quality 2 (RA)			.63	3.18*		
Child development goals					.97	62.49**
Child health goals					.98	75.79**
Family support goals					.96	88.50**

Notes: RA= Reliability Assessment
*p < 0.01
**p < 0.001

Table 10

Latent Variable Covariance Matrix for Original Model

Quantity	1.00		
Quality	0.18	1.00	
Content	0.95**	0.13	1.00

**p < 0.001

Table 11

Indicator Estimates and Corresponding Latent Variables for the Modified Model

	Regression weights					
	Quantity		Quality		Content	
Indicator	β	b	β	b	β	b
Total number of home visits	.99	31.27**				
Duration in program	.97	35.18**				
Delivery quality			.74	4.03**		
Delivery quality 2 (RA)			.78	4.62**		
Response quality			.84	2.35**		
Response quality 2 (RA)			.63	3.18*		
Child development goals					.97	62.49**
Child health goals					.98	75.78**
Family support goals					.96	88.51**

Notes: RA= Reliability Assessment
*p < 0.01
**p < 0.001

Table 12

Latent Variable Covariance Matrix for Modified Model

Quantity	1.00		
Quality	0.18	1.00	
Content	0.95**	0.13	1.00

**p < 0.001

Multidimensional Home Visiting Integrity:
Joint model of Raikes et al. (2006) and Power et al. (2005)

Program Delivered

- Quantity
  - Visits offered
- Quality
  - Visit/ visitor competence
- Content
  - Program checklist, percent of time focused in an area

Program Received

- Quantity
  - Visits received
- Quality
  - Family engagement
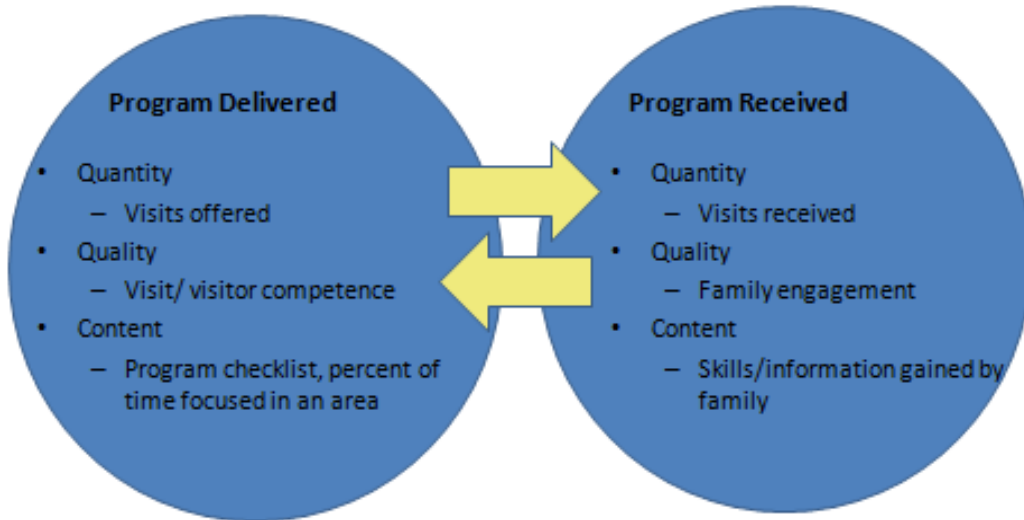- Content
  - Skills/information gained by family

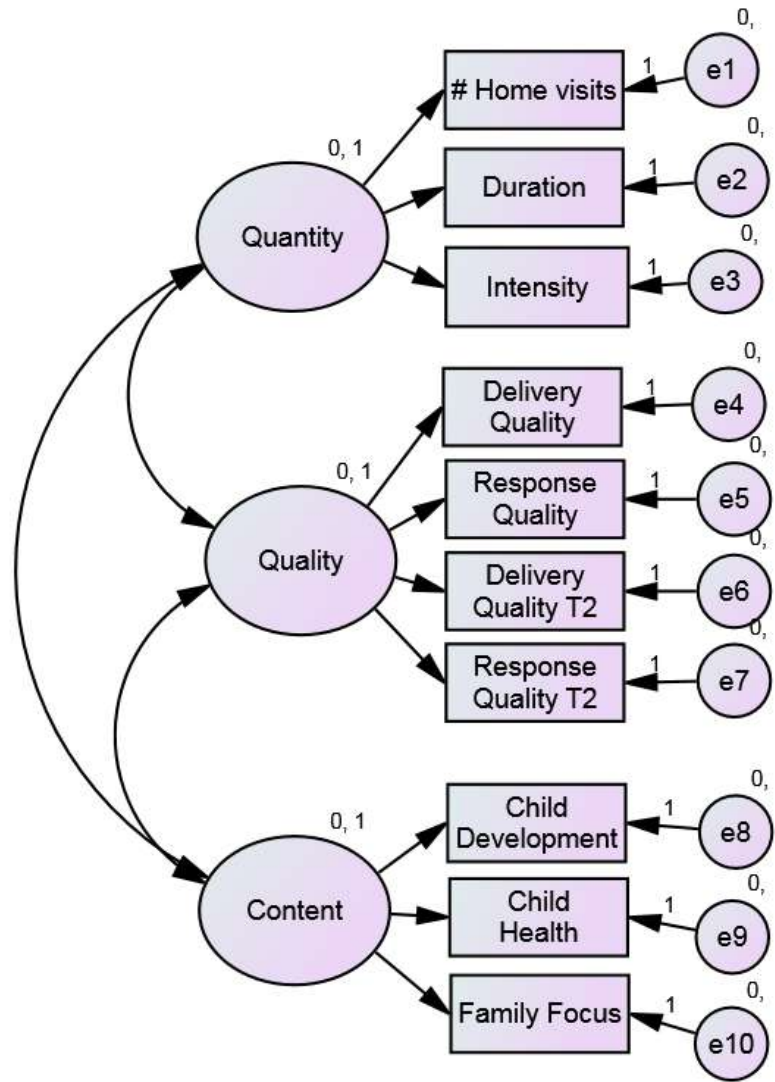*Figure 1.* Conceptual model of home visiting integrity.

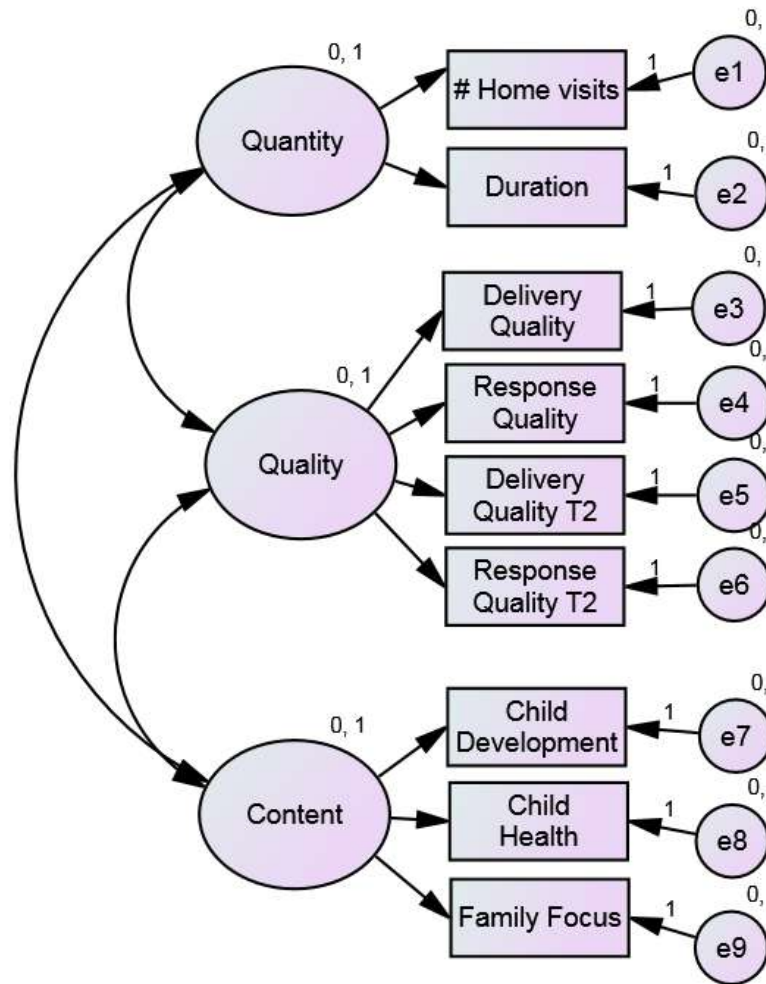*Figure 2*. Original measurement model of home visiting service delivery (Model 1).

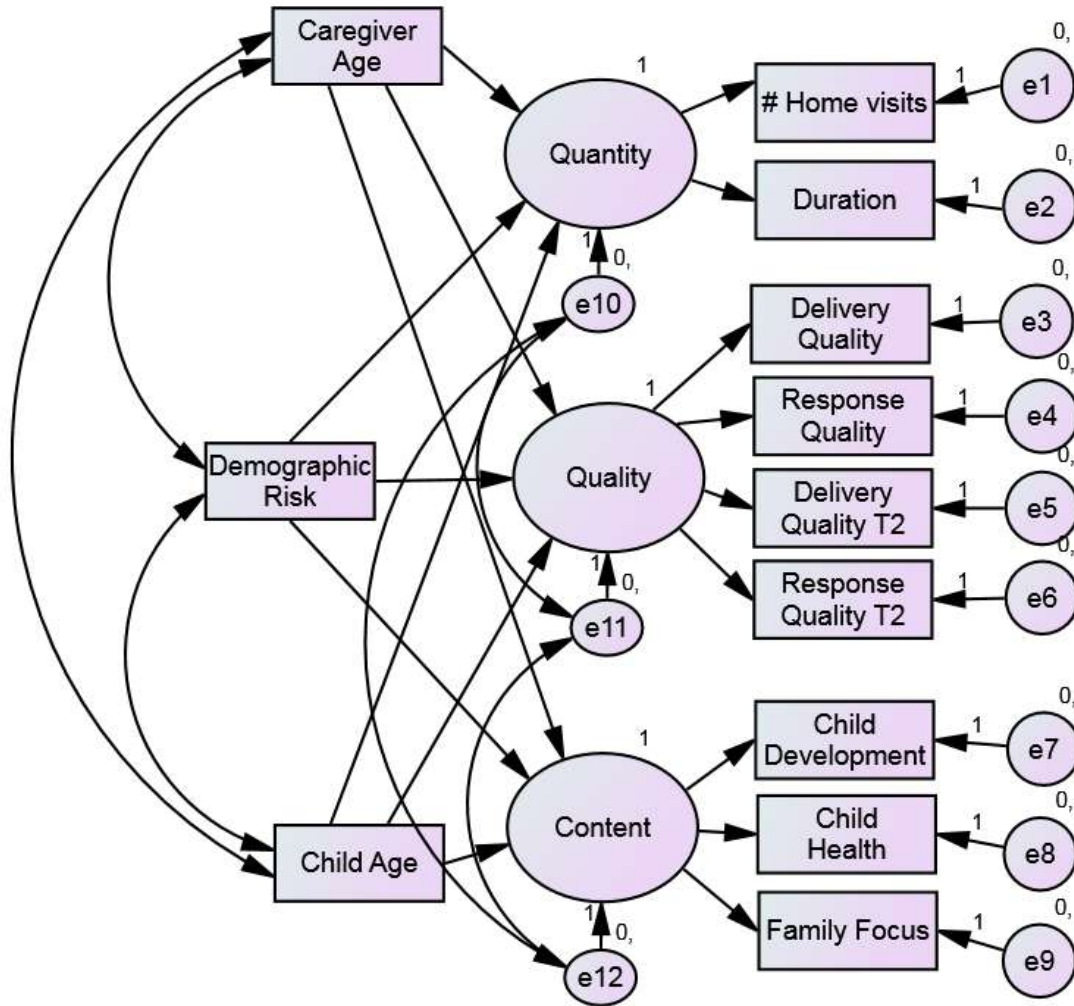*Figure 3.* Modified measurement model of home visiting service delivery (Model 2).

Figure 4. Full SEM model of demographic variables and home visiting services.

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Appendix A

Home Visiting Process Scale (HVPS)

Please indicate how strongly you agree or disagree with the following statements:
1= Disagree Strongly   2= Disagree   3= Neutral   4= Agree   5=Strongly Agree

Statement	DS 1	D 2	N 3	A 4	SA 5
1. My Child Development Partner (CDP) shares information with me about children's development or parenting strategies	O	O	O	O	O
2. We are excited to have our EHS visit each week	O	O	O	O	O
3. I believe that my CDP genuinely cares about my child and family	O	O	O	O	O
4. Together, my CDP and I decide what activities to do in the visit	O	O	O	O	O
5. We are ready to start when our CDP arrives (e.g., child is waiting, t.v. is off)	O	O	O	O	O
6. My CDP is consistent and dependable. I know I can count on my CDP.	O	O	O	O	O
7. My CDP helps connect me with community resources for my child and family	O	O	O	O	O
8. I ask questions about my child's development, family issues , or other topics of interest	O	O	O	O	O
9. I feel comfortable sharing personal information or concerns with my CDP	O	O	O	O	O
10. The visit activities are specific to the desires and needs of my child and family	O	O	O	O	O
11. I take the lead with activities during the visit	O	O	O	O	O
12. Together, my CDP and I problem solve by breaking problems into smaller steps	O	O	O	O	O
13. My CDP helps us meet our family goals (ex., obtain employment, find an apartment)	O	O	O	O	O
14. I notice my child's progress during the week	O	O	O	O	O
15. My CDP is interested in learning about my family	O	O	O	O	O
16. During home visits, we monitor my child's progress	O	O	O	O	O
17. Together, we spend time interacting (ex., talking, reading, sharing) during the visit	O	O	O	O	O
18. My CDP is respectful of my family's routines and culture	O	O	O	O	O
19. My CDP involves me in the play and teaching activities during the visit	O	O	O	O	O
20. I complete my weekly assignments after a visit	O	O	O	O	O
21. My CDP provides me with encouragement and makes me feel more confident	O	O	O	O	O
22. My CDP incorporates the whole family into the visit	O	O	O	O	O
23. I am provided the program in a language I am comfortable speaking (ex., Spanish, Bilingual)	O	O	O	O	O

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PA Certified School Psychologist K-12
- Conducted psychoeducational assessments to determine eligibility for educational disabilities identified under IDEA (e.g. Specific Learning Disabilities, Emotional Disturbance, Other Health Impairment, Autism)
- Provided on-going, data-based consultation to teachers and professional staff regarding interventions to promote children's physical, academic, behavioral, and social-emotional health
- Consulted and collaborated with parents, regular and special educators, specialists, administrator, and community service providers in developing intervention packages tailored to support students' needs

PROFESSIONAL AFFILIATIONS

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- Provided individual/family therapy and coordinated care for patients attending a specialized school designed to meet the comprehensive needs for children with severe chronic illnesses, including Leukemia, Hemophilia, Diabetes Mellitus- Type I, and HIV. Supported the implementation of positive behavior support strategies and behavioral consultation in the classroom. Promoted family involvement in children's medical and educational routines at home and school
- Collaborated with Rheumatology, Neurology, and emerging hospital-wide interest to recruit and direct the Stress, Illness, and Pain Skills (SIPS) group, a skills-based intervention group for adolescents
- Conducted initial psychological consultations for children and families with a variety of behavioral and/or emotional concerns in the larger community seeking access to mental health care
- Designed and implemented behavior modification strategies in outpatient therapy for Weight Management (under 5 years old) and Pain Management patients and their caregivers

Lenape Valley Foundation, Doylestown, PA   July 2011- July 2012
Psychology Intern, *Behavioral Health Rehabilitation Services and Outpatient services*
Doctoral internship under the supervision of a licensed psychologist to provide comprehensive psychological/behavioral health services to children (2-18 years old) and their families

- Provided individual and family therapy in the outpatient clinic, as well as in home and community settings for children with a breadth of presenting problems- chronic illness, developmental delays, intellectual deficits, ADHD, ODD, Bipolar, depression/suicidal ideation, anxiety, selective mutism, trauma/sexual abuse, school problems, eating disorders, dual diagnosis and substance abuse
- Completed comprehensive five axis diagnostic assessments of intellectual, behavioral, and psychological functioning
- Implemented evidence-based behavioral interventions and consultation with caregivers, schools, out-of-school placements (e.g., cyber school, residential facilities, foster agencies)
- Participated on multiple interdisciplinary teams, including psychiatrists, CRNP, mental health clinicians, social workers, school staff, and families
- Coordinated care across tiers of service (OP, BHRS, hospitalization)acting as a liaison between family, school, and medical systems to promote treatment communication, adherence, and continuity

Sacred Heart Hospital, Allentown, Pa.   September 2008- August 2010
Specialized practicum under the supervision of a doctoral level psychologist to provide comprehensive psychological/health services to pediatric clients and their families in a primary care setting over two years

- Provided comprehensive assessment and family therapy services to children and with complex medical and psychosocial difficulties, including depression, social anxiety, specific phobias, ADHD, emotional-behavioral disorder, eating and sleeping disorders, asthma, and diabetes
- Designed positive behavior support plans and interventions to address the needs of children with significant physical/psychological difficulties at home and school
- Provided extensive, on-going consultation with parents, educators, and physicians on issues related to program implementation and treatment adherence
- Conducted individual therapy sessions and crisis services as-needed
- Promoted healthy eating and exercise habits, as well as early reading behaviors, and activities to support parent-child interaction

Lehigh Valley Community Services for Children: August 2009- July 2010
Head Start/Pre-K Counts, Allentown Pa.
Doctoral practicum under the supervision of a nationally certified school psychologist to provide behavioral and mental health services to culturally-diverse, low-income preschoolers and their families

- Completed detail evaluations of children with significant behavior/emotional disorders and provided clear recommendations for intervention linked to assessment results
- Provided consultation to classroom teachers and staff regarding effective instructional and behavioral strategies for class-wide interventions and individual cases
- Provided staff development trainings on the assessment of social emotional concerns in young children and intervention procedures

RESEARCH EXPERIENCE

Project CARES, Lehigh University, Bethlehem, Pa.   August 2006-2011
Data Coordinator & Consultant
- Coordinated data collection and management for large-scale evaluation of an early literacy/language home visiting program for low-income toddlers and families
- Administered standardized measures to assess children's early receptive and expressive language skills
- Collaborated with National Parent Child Home Program, Office of Early Childhood Education, and program families in Philadelphia to evaluate the local program via participatory action research methods

PUBLICATIONS

- Manz, P. H., Bracaliello, C. B., Pressimone, V. J., Eisenberg, R., Zuniga, C., & Curry, A. (2011). Examining vocabulary gains in home visiting programs: Preliminary findings and methodological considerations. Manuscript submitted to Early Education and Development.

- Manz, P. H., Lehtinen, J., & Bracaliello, C. B. (2011). Families' goal setting and achievement in the home-based component of Head Start: Exploring influencing and moderating factors. In print, manuscript accepted to The School Community Journal.

- Manz, P.H., Hughes, C.L., Barnabas, E.R., & Bracaliello, C.B., Ginsburg-Block, M. (2010). A descriptive review and meta-analysis of family-based emergent literacy interventions: To what extent is the research applicable to low-income, ethnic-minority or linguistically-diverse young children. *Early Childhood Research Quarterly, 25*, 409-431.

HONORS & AWARDS

U. S. Department of Health and Human Services, Head Start Bureau
National Head Start Research Scholars Award   October 2010

Lehigh University, Research Symposium
Qualifying Project: *Selected for recognition*   April 2009

Rutgers University
Senior Thesis merited: *Research Scholar in Psychology*   May 2006

Phi Beta Kappa, National Honor Society
Rutgers University, Junior Year   May 2005

GRANTS

Competitively Awarded Research Grants
- **US Department of Health & Human Services, Head Start**   October 2010
  Head Start Research Scholars Grant
  Quantity, quality, and content: An empirical examination of key integrity
  components in Early Head Start home visiting Total Award: $30, 000

Institution Grants

- **Lehigh University, Student Research Grant**   November 2007
Offsetting the barriers to parental involvement in children's education: Examining the benefits of home visiting as an intervention. Total award: $500

SCHOLARLY PRESENTATIONS

Invited Presentations

- Bracaliello, C.B., Manz, P.H., Pressimone, V.J., & Eisenberg, R.A. (2010, May). Cultural influences on shared storybook reading between children and caregivers. An invited workshop presented at the annual Parent-Child Home Program national conference, Uniondale, NY.
- Bracaliello, C.B. & Manz, P.H (2009, April). Home visiting and family involvement: Exploring the quantity of program participation to family outcomes. An invited presentation at the Lehigh University Research Symposium.

Selected Presentations

- Leff, S., Paskewich, B.S., Manz, P. H., Bracaliello, C. B., Curry, A., & Power, T. (2012, February). Developing measures in urban settings through participatory action research. A symposium presentation at the National Association of School Psychologists annual convention, Philadelphia, PA.

- Bracaliello, C. B., & Manz, P. H. (2010, June). Home visiting and child oral language outcomes: Examining the mediating effects of family involvement. A poster presentation at Head Start's Tenth National Research Conference, Washington D.C.

- Manz, P.H., Bracaliello, C.B., Ash, A. N., Pressimone, V.J., Zuniga, C., & Williams, P. (2010, March). Parent-Child Home Program: Examination of Toddler and Caregiver Benefits. Poster presented at the annual convention of the National Association of School Psychologists, Chicago, IL.

- Manz, P. H., Power, T.J., Leff, S., Bracaliello, C. B. & Kratochwill, T. (2010, March). Monitoring multiple dimensions of intervention integrity in applied research. A symposium presentation at the annual convention of the National Association of School Psychologists, Chicago, IL.

- Bracaliello, C.B., Manz, P.H., & Caskie, G.R. (2009, February) Offsetting barriers to Family Involvement. Poster presented at the annual convention of the National Association of School Psychologists, Boston, Massachusetts.

- Manz, P. H., Ash, A., Barnabas, E. R., McWayne, C., Campos, R., Downer, J., Bracaliello, C. B. & Sheridan, S. (2009, February). Taking strides in family involvement: Directions for intervention and assessment. A symposium presentation at the annual convention of the National Association of School Psychologists, Boston, MA.

- Manz, P. H., Barnabas, E.R., Bracaliello, C. B., Ash, A. N. (2008, August). Replication of an evaluation of the first year of parent-child home program services. Poster presented at the annual American Psychological Association convention, Boston, MA.

- Bracaliello, C. B., Manz, P. H., Barnabas, E. R. (2008, February).Collaborative evaluation of a central-city Parent Child Home Program: A report of preliminary outcomes and the partnership process. Paper presentation at the annual convention of the National Association of School Psychologists, New Orleans, LA.