EXPLORING HEAD START PARENTS' AWARENESS AND USE OF PRE-K MATH RESOURCES FOR IMPROVED ACADEMIC ACHIEVEMENT

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education in Educational Leadership/Curriculum and Instruction

University of Phoenix

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EXPLORING HEAD START PARENTS' AWARENESS AND USE OF PRE-K MATH RESOURCES FOR IMPROVED ACADEMIC ACHIEVEMENT

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Date Approved: September 6, 2013

Abstract

The purpose of the study was to explore Head Start parents' understanding of Pre-k math resources to benefit their children's academic outcomes, to explore their experiences of being informed, and to understand how they integrate math learning into to their children's daily lives. The research design was a qualitative van Kaam phenomenological study including 15 Baltimore City, Maryland Head Start parents in face-to-face audio taped interviews. Data collection included a literature review, pilot questionnaire, semi-structured interviews, review of newsletters and calendars. Analysis involved use of Nvivo 10 software to cluster data into statements and graphically sort statements into themes and patterns. Findings suggested Head Start parents had general knowledge of Pre-k math resources identified as Head Start teachers, the Internet, and educational T.V. Parents with at least some college exposure or degree and who earned more than $26,000 per year had more specific knowledge than parents who earned less and had less education. Other demographic distinctions were explored, including married versus single, and older versus younger parents. Regardless of demographic differences, all Head Start parents lacked knowledge of the specific skills their children need for academic success according to the Head Start Content Standards and Early Learning Framework. Findings included recommendations for Head Start and political leaders, and for future research. Educational leaders can proffer from the study by capitalizing on knowledge sources Head Start parents identified as the most effective and by exploring further the source of the knowledge deficit about already available resources.

DEDICATION

I would like to dedicate this work first to God, who gave me strength, mental clarity and focus to endure some of the most trying days of my life. I dedicate this work to my husband, who endured this journey with patience, love, support, and encouragement. This work is dedicated to my children, Eryn, Monet, Creasha, Princess, and Reggie as a model for what is possible in their lives. I dedicate this work to my parents Dr. George R. Dailey, Jr. and Juanita Dailey, who laid the foundation for me to believe that anything is possible. I dedicate this work to the memory of my grandparents Bishop and Lady S.P. Rawlings, and Overseer Louise E. Dailey, the spiritual giants upon whose shoulders I stand.

ACKNOWLEDGMENTS

I would like to thank my Lord and Savior Jesus Christ, my husband Reginald, my children Eryn, Mone't, Creasha, Princess, and Reginald Jr., and my church family. Without their unyielding support and undergirding, I could not have reached this apex in my life's journey. Although there were times I thought I should give up, I realized the sacrifices my family had already endured for me to get to certain stages, and promised myself their sacrifice could not be for naught. My grandparents, the honorable Bishop and Lady S.P. Rawlings, Overseer Louise Elizabeth Dailey, and parents Dr. and Mrs. George R. Dailey, through their constant encouragement, helped me embrace and pursue my true and full potential. To my mentor, Dr. Betty Jones-Goyens, I thank you for your guidance, expertise, wisdom, and willingness to guide me to a successful end. To Dr. Walter (Wali) Gill, I thank you for your concern, time, commitment, and expertise to not only my work, but to my well-being throughout this process. To Dr. Stephanie Vecciarelli, thank you for your time, commitment, and expert eye toward detail and process. To my dear friend Addie Johnson, an incredible inspiration and support, I respect and appreciate you. To all the parents who encouraged me to finish my program so you could send your children to my school, I say thank you. Thank you to all those who believe in the gift that God has placed in me to help parents fully realize and implement their own gift of teaching and preparing their little ones for a prosperous academic future. Thanks to the Word of God that kept me grounded and focused on the fact that if I seek Him first, then all things will be added unto me (Matt: 6:33).

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Chapter 1: Introduction

Parental knowledge and awareness of academic resources are critical for all children's academic success (Kent & Davis, 2011; Farris, Carothers-Bert, Nicholson, Glass & Borkowski, 2012). Parental awareness and use of academic resources results in increased short and long-term academic success. Research confirms parental awareness and use of academic resources among low-income families can mediate the effects of potentially negative variables on student academic outcomes including among other things, "the incidence of poverty, the timing of poverty, and the impact of poverty on the child's social network" (Ferguson, Bovaird & Mueller, 2007, pg. 702). According to Ferguson, Bovaird, and Mueller (2007), children of informed parents who use academic resources score on average 14 points higher on standardized achievement tests than do peers whose parents lack knowledge of resources and therefore cannot use the resources to benefit their children.

Low-income parents, including caregivers and guardians, such as grandparents and other relatives, tend to experience a lack of knowledge regarding school, community, and government-based resources designed to assist them in improving their children's readiness for kindergarten and beyond (Ferguson, et al., 2007). Research confirms the knowledge low-income parents need to ensure their children's academic success rests in understanding how to develop their children's math skills from birth to five (Duncan et al., 2007; Romano, Babchishin, Pagani & Kohen, 2010). Duncan et al. (2007) confirmed math skills developed from birth to five, broadly termed, *early math skills*, serves as the strongest predictor of future academic success. Head Start parents, a segment of the United States low-income community, receive parent education services through the

Head Start program to help improve among other things their knowledge about their children's math skill development (Ludwig & Miller, 2007). Research shows, however, little is known about the knowledge Head Start parents have of the Pre-k math resources designed specifically to assist them in improving their children's overall achievement.

Parental knowledge of the Pre-k math resources provided through Head Start and other related programs may be lacking as evidenced by Head Start students' below-standard math scores on national assessments. Twenty-eight percent of Head Start children on average are able to demonstrate number and shape skills compared to 63% of same age peers assessed in the Early Childhood Longitudinal Study-Birth (ECLS-B) cohort. Research confirms a direct correlation between parent awareness and use of resources with improved student outcomes (Iruka & Barbarin, 2008).

The unfavorable math achievement of Head Start children within the context of the *Information and Knowledge Age* (IKA), defined by rapid technological development (Castells, 2011) serves as a predictor of less than favorable subsequent life outcomes (Schlee, Mullis & Shriner, 2009). Early math skills serve as the strongest predictor of academic and career success (Duncan, et al., 2007; Romano, et al., 2010). What low-income parents, including Head Start parents know or do not know about Pre-k math resources is critical to their children's short and long-term academic success.

One of Head Start's primary goals is to improve the life outcomes of low-income children and their families. Exploring what parents know about the resources available to improve their children's math skills is important for their children's future employability (Schlee et al., 2009). The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start

program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. Chapter 1 is an overview of the study. The chapter includes a background of the problem and the problem statement, as well as the purpose, significance, and nature of the study. The chapter includes the theoretical framework of the study along with a presentation of the assumptions, scope, limitation, and delimitations of the study.

Background

Low-income families historically have lacked awareness regarding opportunities designed to improve their lives and the lives of their children (Chau, Thampi & Wright, 2010). The lack of knowledge or the lack of awareness of resources can lead to negative health, social, academic, and political outcomes (Cummins, Brown, & Sayers, 2008; Lagrade, Haines & Palmer, 2007; Scheck-McAlearney, et al., 2008). Experts expressed concern in 1995 over how knowledge problems among the poor would impact the poor's ability to adapt to the era of rapid technology development (Barrett, 2010; Martin, 2007).

Experts labeled the era of the *haves* and the *have nots* of technology the *digital divide* (Barrett, 2010; Martin, 2007). The digital divide referenced a split between those with access to technology and those without. Martin (2007) suggested low-income families would become the segment of the population without technology and suffer the social and economic consequences in part because of the lack of access to technology and the lack of awareness of the financial and social impacts of the impending divide.

Many low-income families in 2012 are behind in the IKA (Castells, 2011). The economic future of low-income children will depend in part upon how well their parents in partnership with the school system, equip them with the resources they will need to be

competitive academically and in the job market (Gobble & Gwynne, 2011). Students will need a functional understanding of math in order to succeed academically in the IKA (Collins & Halverson, 2009; Gobble & Gwynne, 2011).

Research shows when low-income parents, including Head Start parents receive information and learn how to use interventions, children's academic achievement improves significantly (Coyne, et al., 2009; Norris, 1989; Hanft, Rush & Shelden, 2003; University of Delaware College of Human Resources, 1988). When parents, conversely, are not made aware of resources and opportunities designed to benefit their children, their children's academic and social performance suffer (Karoly & Gonzolez, 2011). Important to developing awareness is the ability to seek for information (Knight, 2005). Information seeking behavior (ISB) literature suggests low-income parents maximize their knowledge of resources by exploring the Internet (Knight, 2005), close family, friends, and social networks (Spink & Cole, 2001). Research-based projects like the Perry Preschool Study, the Chicago Child Parent Center, and the Abecedarian Project, which emerged around the same time as Head Start, introduced parents to academic interventions yielding positive academic outcomes (Temple & Reynolds, 2007).

These early childhood programs had a stronger focus on academics than did Head Start and emphasized active parent involvement (Temple & Reynolds, 2007). The positive results for academic and social achievement from these programs positively correlated with active parental involvement, suggesting without parental involvement, children's achievement results would have been less favorable. Critics suggested despite strong parental involvement, Head Start and other early intervention programs, failed to sustain students' cognitive gains, which appeared to fade by the third grade, and therefore

investments in such programs were believed to be wasteful (Barnett, 2007; Westinghouse Learning Corporation and Ohio University, 1969; Heckman, Moon, Pinto, Savelyev & Yavit, 2009; Spitz, 1992).

The prevailing educational philosophies likely influencing the Head Start program and other early childhood program's to shun teaching parents to introduce Pre-k students to skills above basic math concepts was Vgotsky (1934) and Piaget (1965) who promoted children's cognitive abilities develop through play and progressively through developmental stages. Some educational philosophers viewed math as a subject requiring the development of higher order, abstract thinking skills some experts believed Pre-k students did not possess (Piaget, 1965). Piaget and Vgotsky's theories fail to imagine the integration of play and cognitive activities between parents and children promoting the development of math skills, like the use of LEGO blocks to build robots (Gardiner, 2011).

Singer, Michnick-Golinkoff, and Hirsch-Pasek (2009), noted critics of the play-based approach to learning expected the Head Start program to produce sustaining cognitive results. Singer et al. (2009) noted critics devalued the importance of play in cognitive development. Critics viewed play as detracting from time needed to develop cognitive skills (Hladky, 2005).

The current study explored what Head Start parents understood about Pre-k math resources through the theoretical framework of the theory of coordinated management of meaning (Cronen & Pearce, 1982) and through Head Start's Family Engagement in Transition model. The theory of coordinated management of meaning frames communication between individuals within levels of understanding. What the individual

understands about communication at one level will determine how the individual understands and interprets what is said at the next level. The theory provided a platform for parents to express how they interpret the communication of the Head Start program about Pre-k math resources for their children. The coordinated management of meaning theory was applied to the Head Start Family Engagement in Transitions model emphasizing the importance of communication between the agency and parents with emphasis placed on vital information communicated to parents to ensure successful Kindergarten transition.

Statement of the Problem

The general problem is despite the availability of parental resources to improve parent knowledge (Higgins, Stagman & Smith, 2010), knowledge problems persist among low-income parents regarding ways to improve their preschoolers' academic achievement (Smith & Ashiabi, 2007). Although research shows multiple factors of poverty are correlated with negative academic achievement, the most direct link to academic outcomes is parental awareness and use of available resources (Tudge, 2008), broadly termed in the literature as *parental involvement.* According to Duncan et al. (2007) the most important knowledge low-income parents could have to improve their children's academic outcomes is how to develop their children's math skills from birth to five. Duncan et al. (2007) and Romano et al. (2010) noted early math skills serve as the strongest predictor of future academic success.

The specific problem is little is known about the knowledge Head Start parents have about resources designed to improve their children's academic achievement in math. Duncan et al. (2007) and Romano et al. (2010) noted early math skills serve as the

strongest predictor of future academic outcomes. According to the Family and Children Experiences Survey (FACES) (West, Malone, Hulsey, Aikens & Tarullo, 2010), on average 28% of Head Start students are able to demonstrate number and shape skills compared to 63% of same age peers from a nationally representative sample of over 10,000 students from different socio-economic statuses. These data confirm an ongoing trend of below average early math skills among Head Start students (see Appendix A). This qualitative phenomenological study was framed by the *Head Start Parent, Family, and Community Engagement Framework* (U.S. Department of Health and Human Services, 2011) within the context of the theory of *coordinated management of meaning* theory (CMM) (Cronen & Pearce, 1982, Arnett, Grayson & McDowell, 2008). The study explored, through face-to-face interviews, the awareness 15 Baltimore, MD Head Start parents have about Pre-k math resources and how they integrated these resources into their children's daily lives.

Purpose of the Study

The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. Open-ended questions were used to allow for emerging themes in the data which derived from particular inquiries (Creswell, 2007).

Significance of the Problem

Significance of the study. Knowledge issues among low-income communities have often resulted in negative academic and social outcomes for the children of the

families in these communities. What parents know or do not know often influences whether or not parents act on the available information to benefit their children. Four decades of research on the Head Start program has revealed a continuous development of parent support interventions to enhance parental knowledge of resources to improve children's achievement outcomes (Ludwig & Miller, 2007). Emerging themes from the literature support there is a lack of knowledge of resources among low-income communities, and a lack of evidence exploring the awareness of disadvantaged parents regarding their awareness of available resources. Since Head Start's inception in 1965, Head Start students have shown some improvements in cognitive skills, although children continue to demonstrate below-standard achievement results in early math skills (West et al., 2010), which may be attributed in part to what parents know or do not know about available Pre-k math resources.

Duncan et al. (2007) and Romano et al. (2010) noted math skills developed from birth to five, referred to in the literature as early math skills, serve as the strongest predictor for future academic success. Evidence supporting what low-income parents know about or how they use Pre-k math resources developed by the Federal Government and private sectors is not apparent. Mullhausen and Lips (2010) espoused government efforts to improve math achievement among low-income preschoolers, especially in Head Start, appear wasted, because of persistent below-standard math achievement results. Geist (2008) inferred that investments in early childhood math development are profitable given children's natural proclivity toward math activities.

Federal responses to the outcomes of Head Start research have resulted in several interventions and partnerships designed to improve parent knowledge and engage

preschool age children through direct parent-child interactions (The White House, 2010). Results reveal un-sustained and modest to insignificant improvements in math among low-income preschoolers, including Head Start students (USDHHS, 2010). Graduates of Head Start from1967 through 1999 were not prevented from obtaining suitable employment by having low math scores (National Head Start Association, 2011). Graduates of twenty-first century Head Start programs, however, will likely experience less than favorable outcomes, given 10 to 24 million jobs created between 2012 and 2018 will require a strong math foundation (Gordon, 2009).

Although researchers have explored Head Start parents' perceptions of academic readiness (Brown, Knoche, Edwards, & Sheridan, 2009; McCallister, Thomas, Wilson & Green, 2009; Mendez, 2010), there appears to be a gap in the literature related to what Head Start parents' know about resources designed to help them improve their children's foundational math skills. Further, little is known about how Head Start parents expose their children to Pre-k math resources, or how they may integrate these resources into their children's daily lives. Duncan, et al. (2007) stated early math skills serve as the strongest predictor for future academic success.

Researchers appear to study Head Start parents as a part of the problem (Mendez, 2010; Wainryb, Smetana & Turiel, 2008) rather than consult them to help inform efforts to correct the trend of low math scores. Parents can advise if the Pre-k math resources are or are not reaching the intended audience and if the resources are applied in a way to improve their children's math readiness skills. Leaders within the political and educational community have based policy and funding decisions upon research suggesting among other things issues related to poverty, including low parental

education, and low parental involvement, are the culprits behind low readiness scores among disadvantaged students (Batson, 2010; McAllister, Thomas, Wilson, & Green, 2009). The research frames parents as a part of the problem and not the solution (Elias, 2008).

Significance of the study to leadership. The current study may help fill a void in the literature and provide a voice to the parents of a disadvantaged population for consideration by leadership. Giving a voice to the parents of the Head Start program may help explain to leadership what is known about Pre-k math resources and related interventions programming in the disadvantaged community. The views of Head Start parents may help federal, state, and local governments, and communities understand if the funds designed to improve parental knowledge of resources is in fact reaching the intended audience and may help expose if and how those resources may be used.

Nature of the Study

Overview of the research method. The current study employed the van Kaam phenomenological research model, derived from Edmund Husserl's transcendental phenomenology and Heiddeger's hermeneutic phenomenology (Creswell, 2005; van Manen, 1990). According to Husserl (1970) and Moustakas (1994), phenomenological studies involve exploring the lived experiences of a group of participants around a shared phenomenon. Phenomenology as a philosophy comes from the twentieth century German philosopher, Edmund Husserl, whose interest lie in understanding the structures of consciousness (van Manen, 1990), and whose philosophy transformed into a practice called transcendental phenomenology.

Transcendental phenomenology. Husserl believed phenomenon or experiences derive from the consciousness of the person or subject having the experience. The reality and truth of experience is not as one observes it to be, but as one perceives it to be. One of the primary structures of consciousness, according to Husserl is *intentionality* or consciousness about something, which an individual may express as his or her perceptions, memory, feelings, or attitudes.

Hermeneutic phenomenology. According to van Manen (1990) in Hermenuetic phenomenology, researchers clearly identify the phenomenon or experience they wish to study. Researchers reflect upon what constitutes the nature of the experiences based on responses provided by the subjects and the major emerging themes and patterns. A description of the phenomenon is written and related back to the broad topic of the phenomenon (Embree, 2002). Beck (1998) describes phenomenology as both inductive and descriptive. In Hermeneutic phenomenology, the researcher actively interprets the texts and "mediates between meanings of lived experiences" (van Manen, 1990, p. 26).

Transcendental phenomenology parts with the hermeneutic approach when the researcher brackets or leaves out presuppositions about the subjects, knowledge of the phenomenon, and personal experiences potentially influencing the outcome to allow the subject to present a fresh perspective (Hamill & Sinclair, 2010; Moustakas, 1994). Bracketing also known as *epoche*, allows the researcher to rely strictly upon the descriptions of the experiences of the participants. Transcendental phenomenology seeks to understand human experience as it is lived (Moerrer-Urdahl & Creswell, 2004).

The van Kaam phenomenological research model. Van Kaam (1966) and

Colazzi (1978) proposed a method of phenomenology supported by Husserl's and Moustakas' transcendental phenomenology that supports the researcher suspends presumptions by bracketing his or her assumptions. The method diverges in that researchers collect data from several persons who have experienced the phenomenon. Data is analyzed by reducing information and pertinent statements into themes, a technique known as *phenomenological reduction*. Researchers record the textural descriptions or *what* participants express about the experience related to the phenomenon. Researchers record structural descriptions or *how* the participants experience the phenomenon, including under what conditions, situations, and contexts (Embree, 2002; Moustakas, 1994).

Researchers gather descriptions from transcripts, tapes or statements through a process called *horizonalization* to produce categories of meanings. The researcher then clusters the meanings into themes or patterns. The researcher develops from the data themes to create the textural and structural descriptions. From the textural and structural descriptions emerge the *"essence"* or the experience as perceived by the participant. The van Kaam method is the most appropriate for the current study.

Quantitative versus qualitative research. The philosophical underpinnings of quantitative and qualitative research vary in what philosophers believe is the source of knowledge (Scott, 2007). In quantitative methods, rooted in empiricism or scientism, knowledge is evidenced by results produced from controlled and manipulated experiments. In qualitative research methods, philosophically rooted in the notion of interpretivism, knowledge and truth rest within the individual and is relative to the individual's experience. A qualitative approach in this study was appropriate because it

allowed for the exploration of the awareness Head Start parents have about resources designed to improve Pre-k math skills and how they may use the resources.

Qualitative research builds theory and derives from inductive reasoning, whereas quantitative research methods test theories and seek to confirm or disprove established theories (Creswell, 2007). Proponents of the qualitative method philosophically reject the notion of empiricism or scientism (van Manen, 1990), which supports reality is objective and evidenced by what is seen. Reality, according to proponents of the qualitative method is a function of an individual's or group's awareness of a situation, circumstance, or object. The qualitative method would allow parents to express their level of awareness of Pre-k math resources.

Proponents of qualitative methods embrace the concept of s*ubject-object duality* (van Manen, 1990). The subject or participant and the object or experience exists concurrently and are interrelated. Individuals are connected to their experiences, and those experiences do not exist outside of the individual. Quantitative methods embrace the notion of the mutual exclusiveness of the subject or person and the object or situation suggesting a *subject-object dichotomy* (van Manen, 1990). This position suggests researchers and subjects under study are independent of one another, and the experiences of individuals are external to the self.

In quantitative methods, researchers make predictions or hypotheses about outcomes in support of or against established theories. Researchers control and manipulate variables to achieve empirical outcomes. Researchers collect and process data through the quantitative methods and statistical analysis (Creswell, 2007, Neuman, 2003). The current study did not seek to make predictions about outcomes, but to extract

the meanings and interpretations of Head Start parents related to their awareness and use of Pre-k math resources.

Unlike quantitative methods, qualitative methods rely on the use of in-depth interviews involving audio-taped recordings, note-taking, and observation of participants in their natural environment in order to extract themes and patterns as sources of data collection (van Manen, 1990). Quantitative methods, which rely on statistical analysis would not have allowed for open ended responses providing participants the opportunity to express their thoughts and feelings about their awareness and use of Pre-k math resources. The qualitative method was the most appropriate for the current study.

According to Creswell (2007), quantitative methods use statistical instruments and tools by which to collect data. Qualitative research involves the researcher as the primary instrument of data collection. The researcher uses in-depth interviews, audio-taped recordings to reveal *how* (structural) and *what* (textural) participants experience to determine the essence of the experience. The qualitative approach was the best method to achieve the goal of collecting structural and textural descriptions to obtain the essence or meaning of the experiences of Head Start parents.

Other qualitative methods. Creswell (1998) discussed five major qualitative research methods: case study, narrative research, phenomenological, grounded, and ethnography. Creswell noted a case study is "an exploration of a 'bounded system' or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context" (1998, p. 61). The phenomenon under study was not bound by time or space, neither were subjects explored over a long period, deeming the case study method as inappropriate for the current study.

Narrative research involves the collection of data based on the story of an individual participant (Neuman, 2003). The current study explored the perceptions of 15 Head Start parents. A narrative research approach would have been inappropriate and would not have met the needs of the current study.

Grounded theory, based in phenomenological research, uses the lived experiences of the participants to develop a theory (Creswell, 2007). Creswell (2007) noted grounded theory helps to examine the individuals who share the experience or phenomenon. Although a new theoretical perspective could have emerged from the current research, the goal of the study was not to develop a new theory based on the participant's experiences or perceptions disqualifying grounded theory as an appropriate approach for the current study.

According to Neuman (2003), ethnographic studies explore the shared experiences of a homogeneous group of people, where the researcher becomes a part of the culture to understand how the culture operates. Although the participants were from a homogenous group of Head Start parents, the goal of the current study was not to assess how Head Start parents operated or to understand the culture of Head Start parents. The goal was to assess what perceptions and interpretations parents assigned to their knowledge of Pre-k math resources. According to Moustakas (1994) phenomenological studies involve exploring the lived experiences of a group of participants around a shared phenomenon. The phenomenological approach was appropriate for the current study since Head Start parents share the collective experience of belonging to a low-income status group, and Head Start children on average enter school below their more advantaged peers in Pre-k math skills.

Overview of the design appropriateness. The current study employed a qualitative method using a phenomenological design. A qualitative phenomenological design was the best approach for this study because the research question was designed to explore the perceptions of the participants. Phenomenology explores the meaning of the lived experiences of several individuals about a shared concept or phenomenon and explores the *structures of consciousness* related to lived experiences (Creswell, 1998). Phenomenology may help uncover what meanings Head Start parents assign to their awareness of the Pre-k math resources and their use of the resources. Phenomenology is also concerned with the inward consciousness of the participants (Husserl, 1970; Moustakas, 1994).

The phenomenological approach may allow for the probing of the underlying consciousness of parents related to their understanding and use of Pre-k math resources. Using "epoche" (Moustakas, 1994, p. 180), defined as an unbiased approach, the internal and external meanings Head Start parents assign to their experiences may emerge and allow for the analysis and synthesis of the parents' descriptions. Allowing parents to share the meaning of their experiences through individual and composite textural descriptions may help clarify how parents develop awareness of resources designed to improve math achievement and improve subsequent academic achievement.

Research Questions

The following question directed the study and offer answers regarding the research: RQ 1: "What do Head Start parents know about Pre-k math resources designed to improve academic outcomes?"

RQ2: “How do Head Start parents describe their experiences regarding being informed about Pre-k math based resources and activities in the Head Start program?”

RQ3: “How do Head Start parents describe their use of these or related resources in their children’s daily life?”

In the central research question, the key components are, *what*, *Head Start parents, awareness, Pre-k math resources*. According to Moustakas (1994), the words chosen to develop a phenomenological study question should reflect the intent and purpose of the study. Moustakas pointed out the importance of explaining the key words before the research is conducted. In the question, *Head Start parent*” refers to the participants, all of whom are identified as caregivers in the Baltimore, Maryland, Head Start program. *Awareness* refers to the internal meaning or *noesis* (Moustakas, 1994, p. 21) of how each participant experiences the phenomenon related to their awareness of resources. The implication is different participants may experience the same phenomenon differently.

Describe refers to the external meaning or *noema* (Moustakas, 1994, p. 21) each participant assigns the phenomenon or their external experience. *Experience* is the way each participant consciously reflects on the phenomenon. The question is designed to discover the essence of the phenomenon by unifying parents’ internal and external perceptions (Moustakas, 1994).

Theoretical Framework

Family Engagement in Transition. The current study used a two-pronged theoretical approach. The first approach utilized the Head Start Family Engagement in Transition (FET) model, a sub section of the Parent, Family, and Community

Engagement Framework (PFCE)(USDHHS, 2011) (see Appendix B). The FET model (see Appendix F) stresses, among other things, the importance of providing parents with information training and connections to future Pre-k care and educational settings to help facilitate the transition process between Head Start programs and kindergarten. I explored what information parents received from Head Start and other resources to improve Pre-k math skills and to expose children to Pre-k math programs.

The PFCE framework model promotes the implementation of the Head Start Program Development Standards by program staff and parents alike. The current study sought to understand parent experiences through the FET. FET is a sub-domain of Family Engagement Outcomes (FEO), which is one of four PFCE domains (see Appendix F).

Important to the current study was exploring what parents understood about the resources available to them to help improve the math readiness skills for their children prior to entrance into kindergarten. A goal of the research was to explore how participants integrated these resources into their children's daily living experiences. Also important to explore was how parents described the opportunities they received to discuss their observations with Head Start Staff of their children's strengths and challenges related to Pre-k math skills and exposure to Pre-k math learning in the home.

Theory of coordinated management of meaning. The second theoretical approach employed the communication theory of *coordinated management of meaning* (Cronen & Pearce, 1982). Proponents of the theory of coordinated management of meaning (CMM) (Cronen & Pearce, 1982) suggested through conversation people create meaning by attaining some coherence and coordination. According to Cronen and Pearce

(1982) coherence is achieved when stories are told and coordination emerges when stories are lived. The focus of CMM is on the relationship between people in their society or environment. Individuals organize and create meaning from the many messages they receive through several mediums.

The coordinated management of meaning theory posits meaning exist in hierarchies or seven levels and can derive from:

Raw sensory data – information perceived through auditory and visual means that helps interpret images and sounds;

Content – words interpreted and provided meaning in the context in which the words are spoken;

Speech acts – the attitude, intent, and meaning with which a speaker communicates through words;

Episodes – face to face verbal interactions within a specific context that are understood, defined, and shaped by the context or environment in which the interaction occurs;

Master contracts – defines and helps establish the nature and expectation of the type of communication between communicating participants within an episode;

Life scripts - the set of various settings or contexts in which a participant expects to participate, and

Cultural patterns – content that is governed by social rules that define normalcy for a given episode, reflects the culture of those communicating, and is defined by each communicating participant's cultural frame of reference. (Cronen & Pearce, 1982). Figure 1 outlines the hierarchy of communication within CMM.

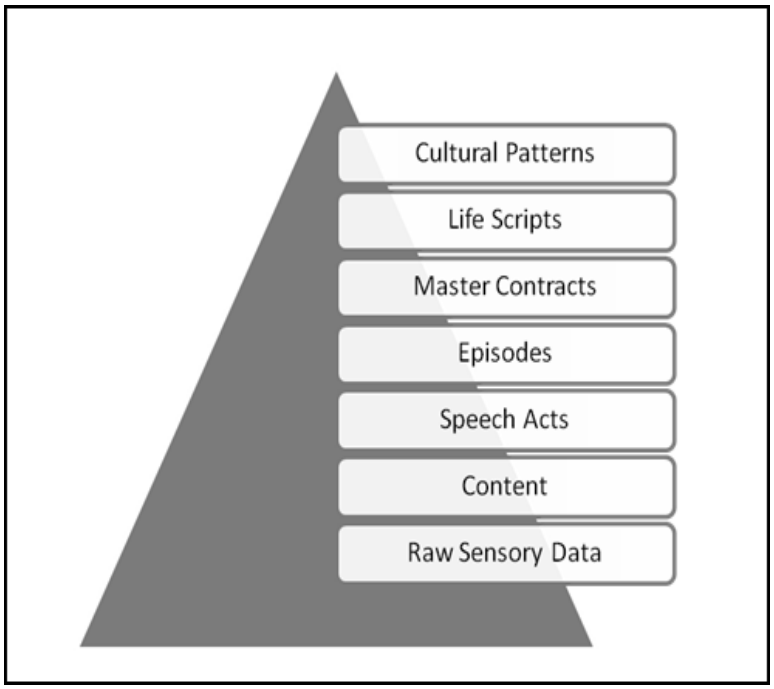

Figure 1. CMM Model. This figure illustrates the hierarchy of communication in the theory of coordinated management of meaning.

According to Cronen and Pearce (1982) individuals use two rules to coordinate the management of meaning within the hierarchy. The first is constitutive rules, which help determine how meaning derived from one level determines the meaning that will be ascribed at another level. The second is regulative rules which help an individual regulate what is said so the individual stays within what is believed to be culturally normal within the context of a given episode.

Using the CMM model, Head Start parents tell their stories regarding conversations between themselves and Head Start staff (HSS) that create meaning around the transfer of knowledge about Pre-k math resources. In the CMM model, HSPs and HSS co-create meaning about the Pre-k math activities designed to produce the readiness skills needed for successful academic learning in K-12. HSPs and HSS co-create

meaning by attaining some coherence (adherence, logical consistency in telling their stories) and coordination or working together by living out the stories.

Coherence occurs when stories are told. After parents receive tools and resources to aid their children's Pre-k math skills, assumed is that HSPs share with HSS their stories or lived experiences of using the tools and resources. Assumed is HSS respond through short assessments of strengths and challenges related to a child's ability to master concepts. Parents' abilities to reinforce skills or use tools are likely assessed in alignment with the guidelines of the Head Start Early Learning Content Standards (Scott, 2011). Assumed is HSS connects parents with known math resources specifically designed to improve Pre-k math skills and future academic achievement.

Coordination emerges when parents and staff experience the stories. The lived experiences of HSPs may reflect parents applying to everyday life the advice of HSS regarding the use of tools, activities, and resources. Head Start Staff may experience the story in the form of continuous monitoring of parental feedback, instructional practices, student achievement, and parental involvement. I explored parent experiences through the tenets of the CMM theory and the FET sub-domain (see Appendix F). This framework helped guide the research in uncovering what Head Start parents knew and understood about resources, including government and private sector resources designed to improve Pre-k math skills.

Definition of Terms

To avoid misinterpretation of terms within the proposal, the definition of terms section provides a basic understanding of key terms. The following terms and definitions applied to the study:

Disadvantaged - is defined in the context of this study as under-represented populations in the African American, Latino, white communities (Kendricks & Arnett, 2011).

Disadvantaged students - within the context of this study relates to low-income students who qualify for free and reduced lunch (Konstantopoulos, 2009).

Head Start - is a federally funded comprehensive early childhood program providing students with academic, emotional, and social readiness skills needed for successful entrance into kindergarten and beyond (Currie & Thomas, 1995; Garces, Thomas & Currie, 2002; Gormerly, Phillips, Adelstein, & Shaw, 2010; Ludwig & Miller, 2007).

Higher wage occupation/earner-occupations that yield incomes above the established level for low-income households yielding incomes between $16, 767 and $22, 350 for a family of four (Federal Register by the U.S. Department of Health and Human Services under the authority of 42 U.S.C. 9902(2), 2011) and with average earnings between 26, 821 to $29,055 for a family of four (Federal Register by the U.S. Department of Health and Human Services under the authority of 42 U.S.C. 9902(2), 2011).

Information seeking behavior – a term that derives from information technology literature (Knight, 2005) that reveals the ways in which people use the Internet to gain knowledge, but can be applied across venue, including, social networks, or family (Case, 2012).

Lived experiences - refers to the individual personal experiences and meanings assigned to those experiences as they occur in daily existence (Trentelman, 2009; van Manen, 1990).

Low-income or low SES (Socio Economic Status) - is determined by income eligibility for free and reduced lunch and breakfast (United States Department of Agriculture, 2012).

Lower-wage earner/occupation- occupations that yield incomes between $16, 767 and $22, 350 for a family of four (Federal Register by the U.S. Department of Health and Human Services under the authority of 42 U.S.C. 9902(2), 2011).

Parental involvement- parents, including caregivers and guardians like grandparents or relatives, engaged with their children and teachers through verbal and written communication, school visitations, and interaction with their children to help compliment the educational process and improve their children's outcomes (Gordon & Breivogel, 1977; Hill & Tyson, 2009).

Readiness Skills-Math - (see Appendix C) relates to the child's ability to recognize numbers and quantities in the everyday environment; reciting numbers in the correct order and understanding that numbers come before or after one another (USDHHS, 2010).

Assumptions

The current study included the following assumptions. The research method selection may be appropriate for exploring the lived experiences of Head Start parents around their awareness and use of Pre-k math resources designed to improve math skills. It was assumed researcher bias may occur because of the qualitative nature of the study. To minimize researcher bias, bias was acknowledged and bracketed (Moustakas, 1994). Researcher bias may occur during the interview process by pre-judging participants based on tone, dress, articulation, and body language.

Researcher bias was projected to occur through stereotyped assessments based on race, religion, gender, ethnicity, or educational background. Researcher bias could have resulted in the misunderstanding or misinterpretation of participant responses leading to inaccurate recording of data. How I dressed, spoke, and communicated through non-verbal cues may have influenced participant reactions or answers. I used participant feedback to critique transcribed interview data. Parents were expected to be honest with their responses.

Scope and Limitations

The focus of the current study was to gain an understanding of parental awareness and use of Pre-k math resources by exploring the lived experiences of Head Start parents. The study included qualitative data obtained for phenomenological analysis of the phenomenon. These data may contribute to the body of knowledge regarding the awareness low-income parents have about the resources designed to improve academic outcomes. The limitations for the current study were found primarily in the qualitative design of the study.

Generalizability of results was minimized due to the size of the sample and the geographic location. Generalization of the study to all Head Start programs was not plausible. Purposeful sampling procedures used to select participants also limited the generalizability of the results of the study because the sample was not representative of all parents of Head Start programs across the country. Some participants may have failed to disclose all the factors potentially influencing their awareness, or how they use or access resources which may have impacted the outcome of the study.

Delimitations

This qualitative study was delimited to interviewing participants from two Head Start programs in Baltimore City, Maryland. The study was specifically focused on Head Start parents' awareness and use of Pre-k math resources for children who will enter kindergarten in the 2013-2014 academic year. The findings of the current study may not be reflective of other Head Start programs in different geographical locations.

Summary

Chapter 1 contains a discussion of the background and statement of the problem, which is the gap in the literature related to what Head Start parents know about the resources designed to improve their children's math skills (Dmitrieva, Steinberg, & Belsky, 2007). Chapter 1 illustrates the disconnect between parent resources to support improved math skills among low-income students and below- standard math achievement scores (The White House, 2009; Rupp, 2009). To understand parents' awareness and use of resources designed to improve math readiness skills, this study used the theory of coordinated management of meaning coupled with the Head Start Family Engagement in Transitions (FET) model.

The volume of parent information programs to assist low-income parents in enhancing the academic performance of their preschool age children, highlights the national commitment to resolve academic achievement issues, including the Pre-k math skills of low-income preschoolers. Resolving the issue will help build a student body competent to compete in the Information and Knowledge Age and warrants research. The current study sought to provide a voice to Head Start parents regarding their awareness of resources to improve their children's math achievement. What parents

revealed may provide insight to leadership about what parents know about the resources, how they use or do not use the resources, and what may contribute the use of lack of use of the resources.

Chapter 2 includes an in-depth review of the literature concerning the historical perspective of knowledge issues among the low-income communities; the impact of knowledge issues on child achievement in low-income communities; information seeking behaviors of the low-income; Head Start as an intervention to improve parental knowledge issues; historical overview of interventions demonstrating how improved parental knowledge of math interventions improve academic outcomes; current interventions by various Federal Government agencies in partnership with independent organizations to improve foundational math skills. Chapter 2 outlines the conceptual framework for the current study.

Chapter 2: Review of the Literature

The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. This chapter presents results from searches of related literature pertaining to areas contributing to the understanding of the impact of parental awareness and use of Pre-k math resources on child outcomes, government investments in Pre-k resources, and parental awareness of Pre-k math resources among low-income communities.

Areas included are the historical overview of knowledge issues among low-income communities; the impact of knowledge issues on child achievement in low-income communities; information seeking behavior of low-income populations; Head Start as an intervention to improve parental knowledge issues; related early intervention programs designed to improve parent knowledge with positive short and long-term outcomes; Head Start standards for math skills; historical overview of interventions demonstrating how improved parental knowledge of math interventions improve academic outcomes; current interventions by various Federal Government agencies in partnership with independent organizations to improve foundational math skills. Chapter 2 outlines the conceptual framework for the current study.

Title Searches, Articles, Research Documents, and Journals

The use of ProQuest, Google Scholar, EBSCO*host*, and ERIC.ed.gov provided a foundation for the research materials used in the current study. The research thus far has resulted in references to scholarly journal articles, books, reference lists, and abstracts.

The literature review included a search of 454 books, titles, journals, and peer reviewed articles of which 207 were used in the current study. Table 1 summarizes the sources used for the study.

Table 1

Number of Sources used for Study

Type	n
Peer Reviewed Journals	141
Books	14
White Papers	17
Internet Sources	35
Total	207

The search of the literature included: The National Center for Education Research (NCER); The National Association of Educational Progress (NAEP); the National Association for the Education of Young Children (NAEYC); National Longitudinal Survey of Youth (NLSY); Information seeking behavior among low-income; the Early Childhood Longitudinal Survey (ECLS) Program; the United States Department of Health and Human Services; the National Council of Teachers of Mathematics (NCTM); the National Institute of Early Education Research (NIEER), and the Administration for Children and Families. Websites have been utilized to access literature pertaining to the proposed study, including: books, bibliographies, and reference listings from appropriate titles to expand searches. Public and university libraries were also accessed for further title searches.

The key words used to conduct the study included: parental knowledge issues, impact of knowledge issues among low-income families, parent support resources for low-income families, and knowledge issues in disadvantaged communities. Other terms include: SES (socio-economic status) low-income parent, low-income parent involvement in early childhood math, math achievement among poor and disadvantaged students, information seeking, disadvantaged and math results. Additional key words included: federal response to low math scores among poor and disadvantaged, at-risk communities, Head Start and math, Head Start standards, Head Start framework, Pre-k math, government math interventions. No Child Left Behind Act, seminal studies and Head Start; early childhood learning theories and math, opportunity to learn; achievement; equity, math readiness, access to math learning opportunities among low-income parents, and challenges to Head Start are also key words used in the study.

Historical Overview

Over the past 47 years the political, educational, and economic environments have shifted from the influence of the Industrial Age (IA) to the influence of the Information and Knowledge Age (IKA) (Castells, 2011). The shift from the IA to the IKA has affected the way in which the United States develops new strategies to create a diverse and globally competitive workforce (Gobble & Gwynne, 2009). Schools and parents, subsequently, must be informed and trained in techniques to prepare adequately children for the twenty-first century classroom.

With the economic boom of the IA came the political and economic pressure for the education system to prepare children to eventually meet the demands of the new industrial economy. The new economy required a workforce primarily skilled in the use

of tools and machines (Malekoff & Papell, 2012). The education of children, which prior to the IA had been the responsibility of parents, was taken over by states. States, in a sense, took the power and choice to influence children's academic outcomes away from parents, especially those in lower socio-economic realms. Progressives, following the lead of Jane Adams, a social and political activist for the disenfranchised, fought to ensure the disenfranchised benefited from the economic boom (Malekoff & Papell, 2012). Business-led interests, however, sought to relegate the low-income to low-end jobs that served the industrial economy, but reserved high skilled trades requiring more formal education for the socially and economically affluent.

During the IA what low-income parents knew or did not know about resources to benefit their children was of little effect (Smith, 2012). The broader economic and political interests ensured school systems tracked lower-income students into manual labor jobs with little opportunity for upward mobility, and more affluent students toward trade and technical schools and institutions of higher learning (Collin & Halverson, 2009). Opportunities to access the more affluent realms of society were limited by economic, social, cultural, and language barriers. Although the system of segregating the poor and more affluent by education served the broader political and economic interests of the IA, the long-term effects would eventually negatively impact the United States' ability to effectively compete in the global economy of the twenty-first century.

The twenty-first century classroom is heavily focused on science, technology, engineering, and mathematics (STEM) (Castells, 2011) with attention to producing a diverse workforce equipped to meet the demands of an IKA global economy (Gobble & Gwynne, 2009). The foundation of STEM, early math skills, is developed from birth to

five (Duncan et al.; Romano et al., 2010), a period during which many low-income families may lack awareness of and access to Pre-k math resources outside their circle of influence (Gatlin, 2008). Duncan et al. (2007) and Romano et al. (2010) suggested a direct link between Pre-k math skills and academic and career success, noting early math skills serve as the strongest predictor of future academic success. What low-income parents know and understand about how to use the resources designed to improve their children's Pre-k math skills may determine in part how well their children perform academically and to what extent they are able to participate successfully in the IKA.

Parental awareness and use of academic resources historically have been important factors in the successful outcome of all children (Duncan et al., 2007; Duncan & Brooks-Gunn, 2000; Pomerantz, Moorman & Litwak, 2007; Tudge, 2008). The children of parents who are aware of resources and apply their knowledge to their interactions with their children, have better outcomes than children whose parents lack awareness and do not use available resources (Dearing, McCartney & Taylor, 2009). Research has associated parent wealth and education status with awareness and academic outcomes (Altschul, 2012; Gatlin, 2008).

Parental awareness and academic outcomes appear to be linked to school participation (Child Trends Databank, 2007; Henderson & Mapp, 2002). Fifty-one percent of parents, for example, above the poverty level compared to 26% of parents below the poverty level volunteer or serve on school-based committees (Child Trends Databank, 2007). School based committees increase parental awareness of policy related information potentially impacting student outcomes (Barnard, 2004). Barnard (2004)

suggested a direct link exists between parental involvement in the school and academic achievement, supporting the findings of the Child Trends Databank.

Pre-k math and academic and career success. Academic and career success in the IKA is linked to success in the STEM disciplines (Gonzales, 2010). Pre-k math serves as the basis for academic success which includes success in STEM (Duncan et al., 2007; Romano et al., 2010), although some researchers believe strong socio-emotional well-being and cognitive skills best prepare children academically (Atkins-Burnett, 2011). Some researchers support that social and emotional aptitude along with language and cognition serve as the foundation for improved academic outcomes (Barret et al., 2007; Taumoepeau & Ruffman, 2008). The National Council of Teachers of Mathematics (NCTM) and the National Association for the Education of Youth and Children (NAEYC) in a joint position statement (NAEYC, 2010), however, support Duncan's et al.'s and Romano et al.'s argument that early math skills serve as the foundation for improved academic outcomes and urge high-quality math instruction for students ages three to six.

To discern which domains had the greatest impact on academic success, Duncan and his colleagues conducted a quantitative analysis involving a nationally representative sample of 16, 387 children. The children were assessed upon entrance into Kindergarten and again in middle school on six data sets, including: measures of reading and math competencies, attention skills, pro-social behavior, and antisocial and internalizing behavior. Findings from the study suggested early reading, early math, and attention skills predicted future positive academic outcomes, with early math skills being the most consistently predictive.

Contrary to research supporting social and emotional development as key factors to later academic success (Barret et al., 2007; Taumoepeau & Ruffman, 2008), Duncan et al. found early behavior problems and social skills were not correlated with later reading and math achievement. The findings were consistent across studies and data sets, lending support to the notion that early math skills serve as the strongest predictor of subsequent academic success. Duncan acknowledged attention skills and ability to stay on task were moderately predictive of future academic success, but rejected the notion that early behavior problems or social and emotional health were correlated to academic performance.

In a second study (Duncan & Magnuson, 2009) involving 2, 843 children, Duncan along with colleague Katherine Magnuson, used the same six data sets as in the first study conducted by Duncan et al. (2007). Findings revealed students in grades K to 5, who had persistently low math skills, were much less likely to graduate from high school or attend college, validating early math as the strongest predictor of future academic success. What parents know about how to improve their children's Pre-k math skills, therefore, is critical to their children's academic and subsequent career success.

Parental awareness and use of resources - overview. Historically, the influence of parental involvement, which increases the parental awareness and use of resources (Williams & Sanchez, 2011) to benefit children's academic outcomes has been studied from the perspective of parent characteristics, like parental education status and family income (Altschul, 2012; Morales & Saenz, 2007). Studies associated family wealth and education status with children's academic outcomes (Altschul, 2012).

Middle-class and affluent families were believed to have greater access to and knowledge of resources to benefit their children's academic outcomes (Gatlin, 2008; Teske, 2012).

Lee and Burkham (2002) in a seminal study assessing the entrance scores of a nationally representative sample of Kindergarten students found that students in the highest socio-economic status group performed 60% higher than students in the lowest (SES) group. Phillips, et al, (1998) confirmed Lee and Burkham's results after conducting a similar study on a large-scale data set of Kindergarten students. The results showed that one third of the score differences were attributable to differences in the SES background of African American and Caucasian students. Wang (2010) confirmed the findings of Lee and Burkham (2002) and Phillips, et al. (1998) but diverged by adding that the opportunities to learn mathematics were different for African American and Caucasian Students.

Gatlin (2008) expanded on the concept of wealth as a driving force behind more affluent parents' access to knowledge needed for their children's academic success. Gatlin suggested affluence is associated with a culture of education. Within a culture of education, academic achievement is promoted through trans-generational means, whereby parents begin educating children as early as birth, a practice which is then repeated throughout generations. Parental motivation and expectation for high academic achievement are inherently a part of the culture of education (Gatlin, 2008). Inferred from Teske (2012), who suggested low-income parents have limited access to social networks that can expand their knowledge of resources, is that the lack exposure to a trans-generational culture of education may also limit the awareness of the opportunity to seek and retrieve resources.

Wealth, which provides greater access to the knowledge and use of available resources, was associated with improved parental motivation and increased parental expectation yielding greater student outcomes (Gatlin, 2008). Cheadle (2008) confirmed motivation and expectation for children among minority parents yielded similar positive academic outcomes. Lower-income families were generally associated with having less access to or knowledge of resources to benefit their children's academic outcomes because of their lack of financial resources (Williams & Sanchez, 2011).

Low-income parent awareness and use of resources. Preschool academic outcomes vary in part as a function of parental awareness and use of available resources (Cooper, Crosnoe, Suzzo, & Pituch, 2009). Cooper, Crosnoe, Suizzo, and Pituch (2009) conducted a study using multiple levels of data from the Early Childhood Longitudinal Study, n=20,356, to determine the impact of parent involvement among impoverished families on children's academic outcomes. Results showed parental involvement negates the effects of poverty on student achievement. Cheadle (2008) stated low-income parents who are motivated toward successful outcomes for their children employ a technique called *concerted cultivation*, lending support to Cooper et al. (2009). Concerted cultivation is a concept used to describe the creativity and motivation of low-income parents to negate the effects of poverty by improving their knowledge of resources through community activities, like visits to the library or local museums.

Information seeking behavior of low-income groups. Information seeking behavior (ISB) literature suggests low-income parents maximize their knowledge of resources by exploring the Internet (Knight, 2005), close family, friends, and social networks (Spink & Cole, 2001). Knight (2005) found low-income African Americans

preferred informal sources of information over more formal sources. Knight noted low-income groups tend to trust more informal sources, like the Internet, and distrust more formal sources, like school officials or other authority figures because information shared from the latter appears irrelevant to the everyday problems of the group. Knights findings lent support to earlier findings by Spink and Cole (2001) who found low-income populations tend to seek information from most directly related to issues that directly affect the family, including housing and health, and education (Spink & Cole, 2001).

The ISB literature revealed low-income populations, especially among African Americans, have a greater preference for receiving information through informal sources than through formal sources (Knight, 2001; Spink & Cole, 2001). There appears to be suspicion towards more formal sources like, school officials, local law enforcement authorities, or anyone considered outside the small circle of influence for low-income populations. Researchers (Payne, 2001; Lott, 2001) suggested because of the immediate financial and pressing social needs facing those within low-income groups, information that is shared must be relevant to solving the problems of daily existence.

Most low-income families perceive information disseminated from the middle class as irrelevant to meeting those needs. Spink & Cole (2001) found low-income parents identify family and school issues as their most pressing concerns and therefore the information they receive must in some way be relevant to solving these related issues. Low-income families tend to seek specific sources of information and avoid others (Knight, 2005). Researchers have found low-income groups tend to avoid newspapers as a trusted source for reasons including the presentation (including the way in which words are phrased, and images) which is believed to conflict with the way poor people process

information. Knight found a greater reliance on friends and family as a source of information.

Knight found 33% of low-income people in a low-income housing community used the public library compared to 66% who did not use the library, or other sources of technology like the computer or Internet. The same 66% understood the importance of the library for developing and improving literacy skills and having access to the Internet. The information from Knight's study is consistent with a previous study conducted by Bishop, Tidline, Shoemaker, & Salela, (1999), who found low-income residents depended on both informal interpersonal sources and formal resources for community-based needs. Results from Bishop et al.'s study also found residents failed to use the library as a source of information and believed to be less important in obtaining information about community resources. Consistent with Spink and Cole's (2001) study, participants in Bishop et al.'s study depended more on personal sources, like family, friends, and their social network to provide them information about resources within their local community.

Inferred from Spink and Cole (2001) is that because low-income groups process information in group settings, like families and social networks, information received in other formats, like newspapers, flyers, or other print mediums may allude the target group as being less meaningful. Chatman (1991) like Spink and Cole supported the primary source of knowledge among the low-income as the interpersonal exchange between family and social networks. Chatman found, however, that participants relied on newspapers and television for important information to improve their lives.

According to Knight, two factors determine the acceptance of information by low-income communities: a) plausibility, and b) credibility. If information is plausible meaning the information makes sense within the social, academic, financial schema of the families receiving it and the families can relate to it based on their personal experiences, then the information is received and applied. The information must also be credible or believable. Knight found 36.5% of participants relied upon themselves as believable sources of information, followed by 26.9% who said mass media, 13.4% stated television 9.6% newspaper news.

Knight's argument lends credence to Teske (2012) argument that low-income parents sense the educational system is "rigged against them" (p. 79). Lending further support to the argument is Payne (2001) and Lott (2001) who suggested the social class divide between low-income groups and middle-income systems negatively skews the perception of access to resources in the middle-class system. The skewed perception possibly leads to a sense of distrust among the low-income, forcing them to seek information through more trusted and less obstructive sources like the Internet, family members.

Payne (2001) suggested low-income families' knowledge of resources is likely hindered because of their inability to access or understand the *hidden rules* of the middle-class, in which the clues and communication about how to access resources exist. Bruton & Robles-Piña (2009) expanded Payne's stating low-income and educationally deprived families lack knowledge of white middle-class values and culture resulting in less favorable academic outcomes for their children. Brown and Low (2010) inferred if the middle-class system was to improve knowledge of and access to information and

resources, the cognitive deprivation, lack of motivation, and chaotic living conditions among the low-income would potentially negate the knowledge gains achieved. Information from these studies is important to the current study as understanding the sources of information Head Start parents rely on and trust to inform their decisions may help leaders better understand the most effective mediums for reaching the target group.

Pre-k math resource knowledge needed for improved outcomes. Iruka and Barbarin (2008) studied the beliefs and attitudes of parents with children in public Pre-k programs regarding the academic skills parents believed were needed for future academic success. Results showed parents placed less emphasis on Pre-k math in the home and greater emphasis on social and cognitive functioning. This result aligned with the notion that social, emotional functioning and cognition serve as the basis of academic success (Barret et al., 2007; Taumoepeau & Ruffman, 2008). Supporting Iruka et al.'s findings, Cannon and Ginsburg (2008) reported mothers of preschool age children placed greater emphasis on daily living skills than on Pre-k math development.

The type of knowledge benefitting both low-income and more affluent families includes information which helps parents understand the foundational skills their children need in order to improve their future academic success (Duncan, 2011; Duncan et al., 2007; Romano et al, 2010). Duncan et al.'s (2007) findings of the predictive link between Pre-k math skills and future academic success are critical for parents to know and understand how to implement. Parents above the poverty level may be aware of resources designed to improve their children's Pre-k math skills (Gatlin, 2008). Low-income families, however, likely lack the knowledge of the research and the available resources (Teske, 2012).

Several Pre-k mathematic intervention programs, for example, exist to assist parents in improving their children's Pre-k math skills and likely stem from research promoting the development of early math skills (Claessens, Duncan & Engel, 2009; Duncan, 2011; Duncan et al., 2007). What is not clear in the literature is the extent, if at all, to which low-income parents are aware of or use the resources. The studies and interventions include, but are not limited to: the Bigeneration mathematic intervention (Starkey & Klein, 2000), the Pre-k Mathematics intervention (Klein, Starkey, Clement, Sarama & Iyer, 2008), and the Early Mathematics Education project awarded through the U.S. Department of Education's Investing in Innovation (i3) fund. The goal of these programs is to help improve, in part, the math performance of low-income children with the aim of increasing their chances for inclusion in the IKA (Burnett, 2008; Sisk, 2007; The White House, 2009; The White House, 2010; U.S. Department of Education, 2011).

The Bigeneration study was designed to improve parental support for Pre-k math development (Starkey & Klein, 2000). The study showed when parents were provided the needed training to teach their Pre-k children mathematics, the parents fully cooperated and demonstrated they were capable instructors for their children. Parental support for the mathematics intervention produced significant improvements in math achievement for children in the experimental group compared to children in the control group.

Klein, Starkey, Clement, Sarama and Iyer (2008) who supported low math achievement is correlated with low SES, conducted a randomized controlled study whereby a mathematics curricular intervention called Pre-k Mathematics was introduced to a sample of 278 Head Start students across 40 programs in New York and California.

Not only were intervention teachers trained in the curriculum, but also parents regularly used the materials sent home by the teachers. Parents received instructions on how to use 18 Pre-k Mathematics home activities involving manipulatives.

Home-base materials aligned with small–group classroom instruction. In addition to a math learning center, the intervention included 27 computer-based mathematics activities supplementing the teacher and parent-based instruction. Math software was also installed on teachers' computers to enhance instruction and learning. The intervention group experienced significantly improved math scores over the control group.

The results of the studies are important to the current study as they clearly demonstrate a positive correlation between well-informed and trained parents in home interventions and children's improved math scores. The studies also demonstrate when teachers approach early math instruction with support from external agents, misconceptions about preschooler's ability to do math dissipate (Joon Sun & Ginsburg, 2009). The findings contradict Barnard's (2004) notion, that parent involvement and awareness are generally only effective through school participation. The findings in the studies, rather, confirm a positive correlation between the applied parental knowledge and use of resources (informed by teacher instructions) and improved child outcomes. The teacher-parent relationship is therefore an important factor in children's academic success.

The Early Mathematics Education Project developed by the Erikson Institute, was selected as one of the highest-rated i3 applications (8^{th} among 1700) and is a grant awarded to schools that demonstrate a commitment to math development for grades Pre-k

to 3 (Ewert, 2012). The grant is part of the $10 billion American Recovery and Reinvestment Act (ARRA) focused on education reform. Funding through 2015 for foundational mathematics will not only include preschool and kindergarten, but first to third grade.

Factors behind knowledge issues among low-income parents. Several factors are believed to influence the awareness and use of available resources among low-income families. Akers (1998) noted the effects of poverty, including hunger, single-parenthood, drugs, crime, educational attainment, social and political forces, and opportunities to learn all influence low-income parents depth of knowledge and use of resources. Several researchers support the idea that parents and their children may lack opportunities to learn about resources that can benefit their children's academic outcomes (Finkee, McNaughton & Drager, 2009; Gresalfi, 2009; Scherff & Piazza; 2009; Sileo & van Garderen, 2010; Wang, 2010; Wiersma, 2007).

Using a subset of data from the1989 to 1999 Early Childhood Longitudinal Study Kindergarten Cohort (ECLSK-C), Wang examined low-income African American and Caucasian students' opportunities to learn. The level of opportunity to learn math may predict successful tenure in math and math related subjects, like chemistry, and biology (Wang, 2008). The instructional methods used in the home and in school can influence how successful low-income children perform in math related fields, a notion consistent with the social context theory which stresses the importance of family and community influence on learning (Bowman, 1999; Klein, Starkey, Clements, Sarama & Iyer, 2008; Child Development Institute, 2010). What Head Start parents express about

opportunities to access Pre-k math resources during the pre-school years, may inform what constitutes their learning opportunities and how they may create those opportunities.

Bartfeld and Ahn (2011) supported hunger negatively impacts low-income parent involvement in securing academic resources for their children, a notion supported by Payne (2001). Payne (2001) noted low-income parents may neglect obtaining educational resources for their children as their focus is on survival in the present. Resilience literature (Charles, Dinwiddie, & Douglas, 2004; Crosnoe, 2009), however, shows when low-income families are faced with negative social experiences, resilience may negate the impacts of low SES, including discrimination, hunger, and socio-economic barriers. How low-income parents express their use of resilience to overcome potential knowledge barriers or lack of access to Pre-k math resources may help elucidate their creativity in obtaining these and other needed resources to benefit their children's academic outcomes.

Additional influencing factors according to Chazan et al. (2009) and Green and Garner (2012) include family background and parenting practices, inferring the way in which parents are raised to value education, access resources, and apply their knowledge determines to what extent they will engage their children in early learning practices beginning at birth, a notion supported by Gatlin (2008). Low-income families often lack opportunities to teach their children math due in part to their limited math language (Benigno & Ellis, 2008), resulting in the lack of opportunities for their children to learn math (Gresalfi, 2009; Scherff & Piazza, 2009; Sileo & van Garderen, 2010; Wang, 2010).

The use of math language and the ways in which parents discuss numbers and math concepts with their preschool children likely contribute to the differences in

achievement between low-income children and their more affluent peers (Benigno & Ellis, 2008). Knowledge of appropriate math terms and the ability to capitalize on learning opportunities in meaningful ways may directly relate to the impacts of poverty, including low parental educational attainment, lack of time, and similar factors (Starkey & Klein, 2008). The preceding factors likely contribute to the perceived barriers to access of Pre-k math resources among low-income parents (Mendez, Carpenter, LaForett & Cohen, 2009; Paylor, 2011).

Intervention efforts to improve low-income knowledge issues. Seminal longitudinal studies like the Perry Preschool Study (Schweinhart, Barnes & Weikart,1993), the Chicago Child Parent Centers (Reynolds & Ou, 2011; Temple & Reynolds, 2007); and the Abecedarian Project (Masse & Barnett, 2002) involved the training of low-income parents in the use of home-based interventions to improve outcomes. The programs focused on low-income populations, as research suggested a direct correlation between the socioeconomic status of parents and the degree of parental awareness and academic involvement in the home (Williams & Sanchez, 2011).

Perry Preschool Study. According to Schweinhart, et al. (1993) a five- year randomized, controlled research-based program, in 1962, called the Perry Preschool study emerged. The study focused on introducing a quality early childcare intervention to a group of 123 impoverished African Americans parents and their preschoolers at risk of school failure. From 1962–1967, children age three and four were randomly assigned to treatment and control groups. Parents of the children in the treatment group received the High Scope Participatory Learning intervention. The control group received no intervention.

Parents were trained to use the High Scope Model in the home. School staff and other supportive adults in and outside the school maintained weekly home visits with the parents and children. Schweinhart et al. (1993) noted visits involved the child and the parents in discussions in which the staff modeled for parents different ways to incorporate the child's classroom activities in the home. PPS is not clear regarding the extent to which parents were engaged and informed about resources, outside of observing how home visitors modeled in-class lessons (Schweinhart, et al., 1993).

Six monographs released since 1970 illuminate the program's effects on participants from preschool to age 40. The intermittent reports covered students at age 10, 15, 19, 27, and 40. The preschool program group had significantly higher achievement scores on the California Achievement Test, including in math at age 14 than did the no program group. It is not clear if the achievement scores were at or above grade level. Results indicate graduates of the PPS had higher scores on the Stanford Binet Intelligence Test, as well as higher grade point averages (Schweinhart, et al., 1993).

The PPS is important to the current study as it emphasizes the importance of parental awareness of interventions to improve academic outcomes. The study does not provide insight into the specific activities parents engaged in other than observing teachers who modeled classroom behavior in the home. It is not clear the direct impact parents had on learning outcomes. Heckman, Moon, Pinto, Savelyev, and Yavit (2009) question the legitimacy of the PPS findings, suggesting methodological shortcomings due to violation of randomization protocols and small sample size making the results less generalizeable.

Chicago Child Parent Centers. The Chicago Child Parent Centers (CPC), the nation's second oldest federally funded early childhood program, began in 1967 (Reynolds & Ou, 2011). The program was center-based and non-randomized. Like Head Start and the PPS, CPC provided educational and family-support services to low-income children and their families. Children received services beginning at age three and ending in the third grade. Like Head Start, CPC offered among other things intensive parental involvement (Temple & Reynolds, 2007). CPS is the only program established in public schools.

According to Reynolds et al. (2011), the overall goal of the program was to promote children's academic success and to facilitate parent involvement in children's education. One of the four building blocks deemed necessary for student success was an emphasis on parent involvement in the preschool years of school. As a result, CPC required parent involvement (Reynolds et al., 2011).

CPC trained parents to engage in a curriculum called DISTAR (Direct Instructional Systems Training in Arithematic and Reading) daily (Furest, 1977). The program involved among other things a math curriculum. Reynolds et al. (2011) demonstrated parental involvement was associated with better school performance including improved math scores.

Results from the CPC reflected preschool students of the parents who received training in the CPC intervention had significantly higher and sustained achievement scores on the Iowa Test of Basic Skills (ITBS), including in math, than did their peers who did not receive the intervention. Reynolds, Ou, and Topitzes (2004) found by age 12, family support behaviors were less effective in producing successful academic

achievement. This outcome was supported by critics who suggested a fade-out effect of the cognitive gains made by children in early childhood interventions (Westinghouse Learning Corporation and Ohio University, 1969).

These data from the CPC are important to the current study as like the PPS, the study highlights the importance of the role of parental awareness and involvement in the success of children's outcomes, including in sustained math achievement through sixth grade. The study further elucidates the long-term academic benefit to children when parents are trained to use the resources. Parents received in-home resources and were taught how to use the resources to achieve the optimum results. Because CPC was a non-randomized study, results are difficult to generalize to larger populations of low-income families. Results of the CPC are also vague regarding the exact level of parent involvement needed to achieve the academic achievement outcomes, although the study clearly identified the instructional tool parents used.

Abecedarian Project. The 1972 North Carolina based Abecedarian project (AP) was a five- year randomized controlled research-based project designed to improve African American students' outcomes, in part by introducing a specialized Pre-k curriculum to parents to use in the home (Masse & Barnett, 2002). The average starting age was four months. Children and their parents remained in the study for five years, three to four years longer than children and parents in the Head Start program. Unlike Head Start, the AP offered parents a home-based curriculum to complement in-class instruction (Masse & Barnett, 2002).

The AP offered a home and play-based curriculum plan for parents but placed emphasis on language development (Masse & Barnett, 2002). Parents received an

individualized curriculum plan for their child and instructions on how to engage their children in learning at least 15 minutes each day. Parents engaged in support activities, visited the classroom, and served on the center's advisory board. Unlike Head Start, and the CPCs, the AP provided parents the option of participating in parenting skills training.

According to Feldman (2004), home visitors taught parents how to compliment in class work by engaging in supplemental home-based activities. The program utilized experienced teachers trained to work with low-income youth, known as Home School Resource Teachers (HSRT). If children required additional educational services, the HSRT assisted parents in completing the appropriate paper work as some parents experienced literacy challenges (Feldman, 2004).

Researchers monitored children's achievement outcomes beginning at age three and consecutively through age six. The children were again monitored at intervals between age eight, 12, 15, and 21. At age three, children were found to have a significant increase in math achievement and IQ scores. Students maintained their math gains through young adulthood. Throughout their schooling children achieved higher than average grade level increases of 1.8 in math, suggesting children were achieving on average, above grade level.

Children experienced significant gains in math achievement at age 21. Sixty-seven percent graduated from high school (Campbell, Ramey, Pungello, Sparling & Miller-Johnson, 2002). Forty-six percent were employed in skilled jobs. Thirty-six percent were enrolled in college. The results contradict the assertion of Duncan et al. (2007) and Romano et al. (2010) math skills developed from birth to five serve as the

strongest predictor of future academic success, showing language development may also play a role in long-term academic success.

The AP was not without critics. Like the PPS, the AP was accused of methodological errors and a small sample size, which impacted the generalizability of the results (Spitz, 1992). Spitz (1992) criticized the results of AP stating the IQ differences between the control and experimental groups were almost identical at ages five and 12 as they were at six months. The results of Spitz's study suggest the AP intervention likely had no effect on increased intelligence or improved math skills.

Spitz also believed the researchers perhaps skewed the results of the AP in favor of the efficacy of the study. The AP, conversely, presents the clearest description of how the program engaged parents and the types of materials provided (Masse & Barnett, 2002). Progenitors of the program understood that given some parents' low literacy levels and personal learning challenges, the program needed to demonstrate for parents how in-class lessons should be taught in the home as the most appropriate way to ensure home teaching closely aligned with in-class instruction.

Head Start's effort to improve parent knowledge of early math skills. One of several organizations designed to assist low-income families in improving their knowledge and application of resources is Head Start (Ludwig & Miller, 2007). Head Start, a comprehensive early childhood education program, created in 1965 under President Lyndon Johnson, promotes parental involvement in children's outcomes. The Head Start intervention serving nearly one million children and parents from culturally and racially diverse backgrounds (see Appendix D) provides parents with resources to improve achievement outcomes including in math. While research confirms the agency's

marked improvement in children's social and emotional development, Head Start children on average score below national norms on early math skills needed for long-term academic success (Family and Children's Experience Survey (FACES), 2011).

Despite the availability of parental resources, the United States Department of Health and Human Services (USDHHS) (2003a), reported children who entered Head Start in 1997 and 2000 scored "well below national norms" (para 2) as compared to a nationally representative sample of same age students from varying socioeconomic statuses. The Woodcock Johnson Revised Third Edition (WJ-R III) established the national norm of 100. Compared to the national average, Head Start students scored on average 87.9 for early math skills, which involved counting to 10, identifying geometrical shapes, and number sense.

Although students in the 2000 cohort showed greater gains over the course of one year in the Head Start program than did the 1997 cohort, both the 1997 and 2000 cohort entered kindergarten with math achievement scores below the national average (see Appendix A). The trend of low math achievement continued through 2009 (West, et al., 2010). According to West, et al. (2010), children entering Head Start in 2009 on average achieved the same entrance score of 89.7 as did the 1997 and 2000 reflecting two thirds of a standard deviation below the norm. The Office of Planning, Research and Evaluation (OPRE) further reported:

> On the ECLS–B math items, the FACES sample is performing about one standard deviation below the ECLS–B sample. While nearly two-thirds of children (63 percent) in the ECLS–B national sample were able to demonstrate number/shape

skills, only 28 percent of Head Start children are able to demonstrate these skills at the start of the program year (p. 14).

OPRE also found White Head Start students on average score closer to national norms than do their African American and Hispanic peers. Regardless of the differences in average achievement scores between the groups, each group scored below the national norm, even after one year of exposure to the Head Start intervention. Below-standard math achievement at the start of Kindergarten is believed to continue and widen with each successive grade (Chatterji, 2006; Viadero, 2010).

According to Gersten, Jordan, and Flojo, (2005) and the National Mathematics Advisory Panel (2008), the math difficulties children suffer in elementary school and beyond have their roots in weak preschool math foundations, an assertion supported by Tudge (2008). Tudge (2008) promoted preschool foundations include the direct experiences children have because of the knowledge their parents exercise in the home and during teachable moments outside the home. The Pre-k math knowledge parents should have to help their preschool children develop includes: competency in whole numbers, understanding the meaning of numbers, and number relationships.

Parents should be informed about how to teach their children to comprehend the meaning of the value of small quantities, to determine if a number comes before or after in a sequence, and assess if a number is greater or less than another number (Gersten, et al., 2005). The Head Start program actively involved parents providing them with resources in the home through materials and instruction to help achieve the program's goals and objectives, including through the expansion of the program in the form of Early Head Start (Paulsell, Kisker, Love & Raikes, 2002). Early Head Start adopted math

among other things into the infant and toddler curriculum based on brain research supporting children's ability to process math concepts during the preschool years from age three to five (Ackles & Cook, 2009; Bodovski & Farkas, 2007; Courage & Setliff, 2009; Fisher, Frey & Lapp, 2009; Jensen, 2008; Perez, 2008; Ratey, 2008; Tudge, 2008). Qualified parents received direct assistance from home visitors providing pregnant mothers and mothers of newborns to age 3 parent education and support, including around how to develop their children's math skills, like counting, number recognition and shape recognition.

During the George W. Bush Administration from 2000 to 2004, investments in parent training and dissemination of information to parents increased to help improve student outcomes, especially among the parents of low-income and other disadvantaged students. Accountability for school and student achievement became paramount for not only K-12, but for preschools (Scott-Little, Lesko, Martella & Milburn, 2007), including Head Start. Parent participation and awareness of resources became essential components of the No Child Left Behind Act (NCLB) of 2001. The literature review did not yield information regarding how it is determined if low-income parents receive the NCLB information and how they use the information and resources to assist their children's outcomes.

State-level Head Start parent knowledge math interventions. Studies like the Oregon Longitudinal Study (OLS) emerged during the 1980s and signified Head Start programs with good intervention strategies and strong parental involvement had potential to produce competitive math achievement results (Norris, 1989; Snodgrass, 1991). According to Norris (1989) OLS assessed the academic performance and placement

indices of former Head Start children from kindergarten through fifth grade. Results reflected students performed at grade level on several subjects including math from the third to the fifth grades. Children were also more likely to be enrolled in gifted programs than their non Head Start peers.

Results from the OLS research reflected when parents received information about a specific intervention and invested time in applying the new information, children's academic outcomes improved. Parental involvement and awareness negated the pervasive effects of poverty (Norris, 1989). Zigler, Abelson, Trickett, and Setz (1982) promoted parent and teacher support combined with increased expectation of Head Start children accounted for the children's motivation to achieve. Zigler et al. (1982) suggested children's academic gains faded during first and second grade because of the absence of the same level of support children received in the Head Start program.

The University of Delaware College of Human Resources (1988) assessed the impact of the three Head Start delivery models – home-based, center-based, and mixed. There were significant academic gains, including in math, among children, whose parents used toys, games, reading materials, and different forms of encouragement across delivery models. The results are supported in the literature (Welsh, Nix, Blair, Bierman & Nelson, 2010; Zaman, 2006).

Welsh et al. (2010) stated there was enhanced academic capacity among children using board games. To expand the Welsch et al. findings, Siegler & Ramani (2008) found children's numerical development improved when their parents received instruction on how to engage their children in board games (Siegler & Ramani, 2008). Data from the studies are important to the current study as support is offered for the

assumption that when parents receive information and gain knowledge about the use of certain interventions, children's academic achievement likely improves (Siegler & Ramani, 2008).

The notion of low-income parents' perspectives having been explored in the literature regarding resources to improve their children's math skills from birth to five may be supported. Further research is needed to uncover if parents are aware of the government and private sector Pre-k math resources designed in part to improve their children's math skills and subsequent academic outcomes. The social setting of a family environment, including parenting practices and attitudes about math, available math resources, and interactions with a child around math activities, is critical to how children learn math (Iruka & Barbarin, 2008).

The literature highlights the policy and procedures about how parents should be engaged and made aware of information important to their children's academic success. The literature is not clear about how well the government and private sectors track if low-income parents, including Head Start parents are aware of the available information and resources. Critical to the current study are understanding parents' awareness of resources like GSGS and how parents explain their use of the resources in their children's daily lives. Incumbent upon the government, private sector, and educational leaders is the need for these agencies to use all possible mediums to ensure awareness and use of the resources to improve academic outcomes.

Current Findings, Interventions, and Outcomes

The United States government, in partnership with state and local governments, has created resources to assist low-income parents in improving their children's academic

outcomes, including in math (United States Department of Education, 2012). Although resources are accessible, and several parents take advantage of the resources, it is not clear if low-income parents are aware the resources exist and if so to what extent the resources are used with their children. Current interventions support past literature demonstrating a strong correlation between parental awareness and involvement and improved academic outcomes.

Although many factors determine achievement outcomes (Akers, 1998), research confirms the most direct link rest between parent involvement and achievement outcomes (Williams & Sanchez, 2011). The government and private sectors have created multiple parent education and support resources to supplement the Head Start interventions (United States Department of Education, 2009). Programs include Parent Information Resource Centers (PIRCs) (United States Department of Education, 2009), Parent Institute for Quality Education (PIQE) (Shumow, 2010), and Parents as Teachers (PAT) (2010).

Parent Information Resource Centers (PIRCs). According to the United States Department of Education, (2012) Parental Information and Resource Centers (PIRCs) serve to shape policy and programs leading to increased parental involvement and awareness of resources to aid low-income parents with the goal of improving student achievement. PIRC grantees must serve rural and urban families, and use half of their funding for low-income children. Thirty percent of PIRCs funds must be invested in early childhood parent programs. Head Start parents are qualified candidates for PIRC programs, in which knowledge about data from school accountability systems is made available and explained to parents in terms understandable to them (USDE, 2012).

PIRCs work in partnership with other programs designed to serve low-income families, like Head Start, to help coordinate parental awareness and improve student outcomes. Parents are made aware of resources designed to benefit their children's academic achievement from birth to five.

U.S. Department of Education Online Resources. The Federal Government, through the U.S. Department of Education provides a host of free web-based downloadable publications designed to inform parents about ways to engage their children in activities that promote early learning skills. The publications include information that teaches parents how to, among other things, improve their children's early math skills. Included in the list of publications is *Parent Power: Build the Bridge to Success* (U.S. Department of Education Office of Communications and Outreach, 2010) and *Helping Your Child Succeed in School* (United States Department of Education, 2002, 2005). The resources provide clear instructions to parents on how to engage their children in learning activities including Pre-k math.

Parent Institute for Quality Education. The PIQE (Shumow, 2010) was founded in 1987 and educates parents of low-income youth in techniques to improve child outcomes. The program has two distinctive programs created to improve parent knowledge and student outcomes, with a focus on Pre-k math skills. The first is the Parent Engagement Education Program (PEEP), the organization's signature program, which educates parents how to create positive learning environments in the home and foster learning within school. The second program, Early Childhood Development specifically targets the parents of low-income children to help improve their knowledge of Pre-k math skills. Long-term studies of the program's efficacy show positive

correlations between improved parent knowledge and student outcomes. The downfall with the program is the limited number of sites across the United States. These programs are currently located in Texas, California, and Minnesota.

Parents as Teachers. Parents as Teachers (PAT) (Schull & Anderson, 2008) closely resembles Early Head Start as the program serves to improve child outcomes by improving parenting skills and resources with children birth to five. The program is an evidence- based home visiting model, through which families identified as high risk receive services to help them focus on developing a relationship between themselves and their child. The program exposes parents to techniques to build academic skills.

Home Instruction for Parents of Preschool Youngsters (HIPPY). Home Instruction for Parents of Preschool Youngsters (HIPPY) (2012) is a home visiting model, much like Parents as Teachers and is one of nine federally approved home visiting models providing low-income parents with knowledge and resources to improve their children's academic outcomes. The program utilizes home-visitors who are native to the communities served, to help avoid cultural divides that may exist between low-income parents and middle income workers, a notion supported by Payne's social class rues theory (2001). Research also confirms a positive correlation between well-informed and trained parents who implement math interventions in the home, and children's math achievement scores (Arnold & Doctoroff, 2003; Cheadle, 2008; Chenoweth, 2009; Klein et al., 2008; University of Delaware College of Human Resources, 1988).

Because Pre-k math has been shown to be foundational to future academic success, recent government and private sector efforts have turned toward investing in developing an increased understanding of how to strengthen parent knowledge and child

outcomes. The government, for example, has sought answers from East Asian nations whose preschool students have high math achievement and whose parents are reported to be strongly linked to their student's math achievement results (Shen, 2005; Tucker, 2011). Shen (2005) argued Asian parents assign schooling the highest priority. Asian parents support and embrace education from birth.

Parents engage in their children's education and are as important to student outcomes as the child's teachers, a notion supported by Parents as Teachers (2010). The influence of parents' involvement from birth appears to be the key in the East Asian advantage (Brenneman, 2009; Shen, 2005). This information is important to the study showing how if parents are involved even as early as birth in introducing their children to math concepts, their children's math achievement will likely improve.

PNC Bank and Sesame Street. Sesame Street, a 42-year-old early childhood public television program, committed in part $7.5 million to the topic of Pre-k math. The show integrates math into the program's daily series (Youngman, 2009). According to Youngman, (2009) of the 26 new episodes, seven would focus on math. Through the Sesame Workshop and PNC Grow up Great partnership, PNC Bank launched a new math initiative called Math is Everywhere (PR Newswire, 2012).

The Math is Everywhere program is a free bi-lingual multi-media kit creating opportunities for parents, caregivers, and educators of preschool age children to turn daily activities into math learning experiences (PR Newswire, 2012). The initiative is supported in the literature (Diamond& Powell, 2011; Jonn Sun & Ginsburg, 2009) as a tool potentially helpful in improving the impaired knowledge parents have about teaching their preschoolers math concepts. What Head Start parents know about the resources

may determine in part how successful their children will be in math and subsequent academic courses.

Sesame Street, produced in accordance with evidence-based research (Zucker, 2009), has notable positive academic affects for its young viewers (Meirick, Sims, Gilchrist, & Croucher, 2009). Sesame Street uses the educational philosophy of developmentally appropriate practices (DAP) to structure and develop its programs for audiences ages three to four (Zucker, 2009). The literature supports the premise that without active parent involvement and awareness of the program as a resource to improve Pre-k math skills, negative life stressors can impede young viewers ability to benefit (Rafferty & Griffin, 2010; Reinemann, Teeter-Ellison, 2008). Rafferty and Griffin (2010) for example, highlight the negative impacts of single parenting, low SES, older siblings in the home, and other related negative environmental stressors.

Proponents of current government Pre-k math initiatives agree exposure to math opportunities beginning at birth provides students with the greatest opportunities for academic success (McCormack, 2010; Tudge, 2008). The government sponsors several additional programs promoting the development of parent awareness around resources designed to improve Pre-k math skills (Homeschool Legal Defense Agency, 2011), like the U.S. House of Representatives bill, H.R. 702-Providing Resources Early for Kids (PRE-K) Act of 2009 (Watson, 2010). The PRE-K Act authorizes the Secretary of Education to award state-level grants to state-funded preschool programs in part to develop the pre-mathematics skills of students from varying socioeconomic backgrounds, including low-income students.

Summary

The literature review exposed some views supporting the idea that improving the knowledge of disadvantaged parents regarding Pre-k math resources is wasteful due to the perception that the target group is lazy (Harris & Jenkins, 2012; Mullhausen & Lips, 2010). The literature also revealed parents who receive home-based resources, including instruction on how to implement an intervention and work with school contributed positively to their children's academic outcomes (Webster-Stratton, Reid, Jamila & Stoolmiller, 2008). Information seeking behavior among the low-income impacts from what channels they retrieve and trust information to improve their children's academic outcomes. Political and educational leaders could make every effort to ensure Head Start parents receive information about Pre-k math resources. Parental awareness and assistance in the application of resources will likely lead to improved readiness scores for Head Start children (Department of Defense, 2010).

The literature review revealed several system-wide and costly efforts have been put forth by the Federal Government and private sector to improve the math skills of low-income preschoolers (White House, 2009; Chenoweth, 2009). Absent from the literature is the voice of the disadvantaged parents regarding their awareness of Pre-k math resources. Research has excluded the voice of disadvantaged parents from the conversation around the awareness of Pre-k math resources that promote readiness in foundational math perhaps because society views poor citizens like Head Start parents as deficient, lazy, and non contributing members of society (Harris & Jenkins, 2012). The literature revealed members of the disadvantaged population are heterogeneous (Chenoweth, 2009). Members of the disadvantaged community are multicultural, multi-

ethnic, from various religious backgrounds, have a wide range of educational and political backgrounds (Chenoweth, 2009).

Chapter 3 will explain the methods and data collection procedures used for the current study. Included is a discussion of the selected methodology and design, a description of the sample population, method of sampling, and the sampling frame. The method for obtaining informed consent, explaining confidentiality are also included along with the process of data collection, including instrumentation used for the collection of data.

Chapter 3: Method

The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. Open-ended questions were used to allow for emerging themes in the data that derived from the particular inquiries (Creswell, 2007). The objective of this research was to reveal new information from the perspective of parents that may inform educational and political leaders about how parents are informed about Pre-k math. The objective includes exposing how leaders can target financial, human, and material Pre-k math resources to improve the parent knowledge of foundational math skills ensuring better math readiness among disadvantaged students.

Chapter 3 contains arguments supporting the appropriateness of the qualitative phenomenological design within the context of the current study. The chapter includes a discussion regarding the target population, specific characteristics of the population sample, informed consent, confidentiality, data collection, and the data analysis methods. Rationale for the data analysis relates to the technique chosen to analyze the data and the type of data collected. Credibility and dependability of the research instrument are discussed.

Research Method and Design Appropriateness

The current study employed a qualitative method using a van Kaam phenomenological design (Groenwald, 2004). A qualitative phenomenological design was the best approach for this study because the research questions explored the

perceptions of the participants. Phenomenology explores what meanings a group of people assign to shared experiences related to shared concepts or a phenomenon (Moustakas, 1994). Phenomenology also explores the *structures of consciousness* related to lived experiences (Creswell, 1998). Phenomenology may help uncover what meanings Head Start parents assign to the phenomenon of the lack of awareness specifically related to Pre-k math resources.

Phenomenology is also concerned with the inward consciousness of the participants (Moustakas, 1994). The phenomenological approach may allow for the probing of the underlying consciousness of the phenomenon. Using *epoche* (Moustakas, 1994, p. 180), defined as an unbiased approach and suspension of presuppositions by the researcher, may allow for the objective exploration, analysis, and synthesis of the internal and external meanings participants assign to their experiences. A description of the phenomenon and the meaning of the experiences participants share through individual and composite textural descriptions may help to clarify the meanings they assign their awareness of Pre-k math resources. A pre-selection interview process was used to determine which participants had experienced the phenomenon.

Neuman (2003) and Salkind (2003) noted the goal of qualitative research is to understand social situations, roles, events, or interactions. Miles and Huberman (1994) noted the qualitative approach is investigative, whereby "the researcher gradually makes sense of a social phenomenon by contrasting, comparing, replicating, cataloguing, and classifying the object of study" (p. 161). Most important to the qualitative research method is the ability of the researcher to understand reality as perceived by the participants and not as the researcher understands reality (Creswell, 2007).

Research Questions

The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. Open-ended questions were used to allow for emerging themes in the data that derived from the particular inquiries (Creswell, 2007). The following questions directed the study and offered answers regarding the research:

RQ1: What do Head Start parents know about Pre-k math resources designed to improve academic outcomes?

RQ2: How do Head Start parents describe their experiences regarding being informed about Pre-k math based resources and activities in the Head Start program?

RQ3: How do Head Start parents describe their use of these or related resources in their children's daily lives?

Population

The population consists of nearly one million Head Start parents affiliated with 1606 Head Start grantees throughout the United State (Data Tables for FACES, 2011). This phenomenological research involved of 15 Head Start participants drawn from 301 Baltimore City, Maryland Head Start parents, defined as legal guardians from two Head Start program sites under one delegate agency. Baltimore City, Maryland was founded in the 1600s. According to the 2010 United States Census, the population is 620,961. There are 15 different Head Start program sites throughout the city. Participants were selected using purposive or quota sampling, whereby based on specific criteria, the participants

were chosen to participate in the study. Creswell (2005) noted purposive sampling allows the opportunity to learn or understand the central phenomenon.

The goal of a phenomenological qualitative study is to extract the essence of meaning from rich textural and structural descriptions provided by participants through horizontalization, reduction and elimination, and finally clustering statements into themes (Moustakas, 1 994). A primary factor that should determine participant selection is the ability to obtain the richness of content. Creswell noted the selection of at least five to 25 participants should be adequate to reach data saturation, a position supported in the literature (Onwuegbuzie, Leech & Collins, 2010). Data saturation was achieved upon interviewing the 15th participant.

Participants and their children who are accepted into the Head Start program largely qualify based on income. Families must earn below 130% of the federal poverty limit (Assistant Secretary for Planning and Evaluation, 2011). According to the Assistant Secretary for Planning and Evaluation (2011), a family of four with earnings of $22,350 per year or less would qualify. States have qualifying criteria as well related to age, disability, and other family members in need. Children must be between age three and five. Children in foster care automatically qualify.

Parents who receive some form of state assistance benefits, like T*emporary Aid for Needy Families* (TANF) also qualify. A family member who lives with and receives support from the parent, or a homeless family qualifies. Ten percent of families served in the program can earn above the 130% of the federal poverty limit. Ten percent of families served by Head Start have children with disabilities. Families and children in the program receive education, health screenings, and social services.

Informed Consent

The study involved participants from two Head Start program sites in Baltimore City, Maryland. The assistant director of Baltimore City, Maryland Head Start received a letter requesting permission to use the premises for the purpose of advertising and recruiting (see Appendix G). The assistant director then received a follow-up telephone call. The contents of this letter contained a synopsis of the study, a request to interview potential participants, and to use a designated Head Start program site to recruit potential participants, who would be rewarded with a $5 McDonald's gift card for their participation. The original proposal stated participants would be rewarded with a $15 Walmart gift card for participation, however, budgetary constraints, necessitated a smaller reward. Participants had no prior knowledge of the gift card to avoid unduly influencing participation or responses (Halpern, Karlawish, Casarett, Berlin, & Asch, 2004). Participants were informed interviews would take place in the Head Start organization in a designated private room to help maintain each participant's confidentiality.

To assist in establishing mutual trust, an element necessary in a phenomenological study to obtain rich quality data (Moustakas, 1994), I attempted to introduce potential participants to the study during an informational meeting with the consent of the Director. Although a flyer had been mailed to the agency two weeks prior (see Appendix H), convening enough potential participants in one location at the same time, presented as a logistical challenge, based on rotating schedule of classes. Some potential participants, for example, arrived at 8:00 a.m, while others arrived at 12:00 p.m. Potential participants received information, individually, and privately, on site during which time they were

pre-screened in face to face meetings about qualifying characteristics of potential participants.

Potential participants received information on the steps needed to obtain quality information, including the need to conduct multiple interviews and the expected length of each interview, which was 35 to 45 minutes. Potential participants expressed interest on site and a date established within the week for the actual interviews. Each participant over the age of 18 who was selected to participate in the study received an Informed Consent form (see Appendix I), which explained the process of maintaining participant confidentiality.

According to Leedy and Ormrod (2010) participation in a study should be strictly voluntary. Participants received information regarding their voluntary participation. Participants received the opportunity to review and sign the informed consent form after agreeing to participate in the study and after doing so were assured of their freedom to discontinue participation without the threat of coercion, penalty, or explanation. Participants were assured their participation or lack of participation would have no impact on their Head Start status. If participants decided not to participate, they were asked to return the consent forms. Participants were advised if they wanted to withdraw from the study, they were under no further obligations during or after the study. Participants were also notified if at any time during the interview process, they became uncomfortable, they had the option to withdraw from the study without consequence or penalty (Edwards, 2005; Moustakas, 1994).

Bogdan and Biklen (2003) suggested implementing a process to protect client confidentiality and the intent of the informed consent. The process includes the following steps:

- Avoid creating an environment that might expose the participants to coercion;
- Maintain the privacy of the participants;
- Be articulate about time constraint and free time of the participants;
- Maintain the integrity of the participants to avoid embarrassment in reporting the interview;
- Give authentic report as a respect to the subject;
- Maintain the term of agreement made at the commencement of the research, and
- Ensure that the result of the finding corresponds with participants' thoughts (p. 43).

In keeping with the code of ethics of phenomenological research, protected populations were exempt from the study, including: children under the age of 18, the developmentally disabled, educationally disadvantaged, and prisoners (Edwards, 2005; Office for Human Research Protections, n.d.). The director of the Baltimore City, Maryland-based Head Start program received the opportunity to review and sign an informed consent form and gave approval to recruit participants (see Appendix G). To preserve the confidentiality of each participant, the director of the program did not receive the names of participants.

Sampling Frame

The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. The study was limited to participants living in Baltimore, Maryland. Purposive sampling selection of Head Start parents in the Baltimore-based Head Start program helped increase the effect of selecting participants pre-screened as low-income.

Through purposive or purposeful sampling, the researcher identifies participants affected by the phenomenon in question (Creswell, 2005, p. 204). Five sample criteria determined the sample population under investigation:

- Participants or co-researcher (Moustakas, 1994) had to be Head Start parents with children who were expected to matriculate into Kindergarten during the 2012 to 2013 school year.
- Participants had to be Head Start parents participating in the selected Head Start program bounded by the borders of Baltimore, Maryland.

  Participants had to be 18 years or older.
- Participants had to be willing to articulate consciously their experiences.

The selection criteria and qualifying questions helped ensure participants would have a vested interest in providing useful information for the research (Shank, 2002).

A pre-selection interview process helped determine which potential participants met the criteria for participation. Participants were to have originally notified me via email or phone of their interests in participating in the study; however, due to logistical

complications related to the agency providing potential participants with ample notice of the study, the process of pre-selection occurred onsite. Teachers were asked to notify potential participants that a researcher was on campus conducting a study and if interested to stop by the designated room for further information.

Potential participants who met the criteria were notified on site after an initial face-to-face meeting. Potential participants who were not chosen to participate in the study, were notified on site. Only one parent whose child would not enter Kindergarten until academic year 2014-2015 was disqualified from participation.

Participants participated in two 35 to 45 minute individual interviews to include one or both parents if available. Participants described in their own words their awareness of available Pre-k math resources and how they integrated these or related resources into their children's daily experiences. A quantitative method would have restricted responses to closed-ended answers (Creswell, 1998), which would not have allowed for the emergence of themes and patterns in the responses provided by participants. The intent of this qualitative research was to (a) explore Head Start parents' awareness of Pre-k math resources and; (b) to explore the lived experiences of Head Start parents with regard to how they integrate Pre-k math resources into their children's daily lives. The most appropriate design was the phenomenological approach.

Head Start parents were considered for participation in the study because the demographics of Head Start participants reflect the characteristics of the low-income among which knowledge issues and below academic achievement persist (Chau, Thampi & Wright, 2010) (see Appendix D). Indicators of participants experiencing knowledge issues and achievement outcomes include, low-income and minority (The White House,

2010). The two indicators of concern in the current study were low-income and minority. Interview questions were pilot-tested (see Appendix O) using one Head Start participant located in Baltimore, Maryland.

This qualitative phenomenological study used purposive sampling strategies to ensure the data collected from the population directly reflected the topic of study, and could provide the highest degree of quality feedback. These data could possibly be generalizable to comparable groups. According to Creswell (2003), sampling design can either be single or multistage. Single-stage sampling involves having access to the names of potential participants in the population and sampling from the list of names (Babbie, 2007).

Multi-stage sampling or clustering can be used when compiling a list of elements to choose the sample is not feasible (Babbie, 2001, p. 107). This phenomenological research utilized the single-stage sampling design because the researcher could obtain direct access to name and contact information for the participant population through multiple sources. Because the participants were Head Start parents, the sampling frame will be easy to replicate using the single-stage sampling design.

The following steps were used to select the participants:

1. A statement of the purpose of the study was sent to the central Head Start office in Maryland. The statement included the intention of the study and a request to introduce the study to potential participants at an information meeting.

2. A flyer and sign-up sheet were sent to the Head Start Agency containing my contact information

3. I met with potential participants individually and privately, on-site to conduct initial pre-screening interviews in a private setting after problems emerged related to attempting to schedule an informational meeting. Potential participants expressed interest or disinterest at the time of the face-to-face screening.

4. The 10 minute pre-screening interview served two purposes: a) to inform the interviewees of the purpose of the study and their rights in the study process, and b) to determine if the interviewees met the criteria to participate and have the time to commit to the study.

5. I and the participants agreed to the appropriateness of their participation.

The purpose of the selection process was to eliminate any misconceptions and anxieties on behalf of the participants and to preserve each participant's sense of dignity (Creswell, 2010). Prior to conducting the study, a parent, purposefully sampled and who met the requirements for participation, participated in a pilot test of the interview questions. According to Babbie (2001), researchers should test questions prior to distribution to protect against researcher bias and error. The participant reviewed the questions for understandability and ease of reading, which ensured the interview questions were crafted in terms understandable to the participants. The pilot participant was asked to rate the questions using a pilot questionnaire form (see Appendix O). Individual data collection helped distinguish differences or similarities between the experiences reported by the respondents.

Confidentiality

I and the participants co-signed a Promise of Confidentiality form (see Appendix J). Explained in the form is the need to maintain confidentiality regarding the interviews.

Kaiser (2009) stressed the importance of the assurance of confidentiality to participants as many potential participants may decline participation without such reassurances. Each participant received assurances regarding the processes of storing, safeguarding, and destroying of their information, including consent forms, transcripts, demographic information, and audio-tapes.

Participants received information regarding the process of the electronic storage and encryption of their data and were advised of the limited access to data by the researchers. I assured participants their hard copy transcripts would be stored in a locked and secured location owned by myself. I assured participants documents will be destroyed through the process of shredding, of which participants will be notified (see Appendix K).

To protect each participant's identity and avoid risk of self disclosure, I used coding and pseudonyms (Leedy & Ormrod, 2010). Leedy and Ormrod (2010) suggested the use of coding and pseudonyms not only maintains confidentiality of the participants, but ensures neutrality, thus limiting the influence of bias. The code HSP 1-15 will be used to represent the Head Start parents.

Data Collection

Creswell (1998) stated a goal of qualitative research is to select purposefully the informants who will best answer the research question. From a population of 301 Baltimore City, Maryland Head Start parents, this phenomenological qualitative study purposefully sampled 15 participants to explore the perceptions and lived experiences of Head Start parents regarding their awareness of Pre-k math resources designed to improve math skills. A pilot test of the questionnaire (see Appendix O) preceded the

study to help field the questions and determine the understandability and ease of questions.

Data collection involved the use of a tape recorder, which was used to record participants during interview sessions. Interview sessions lasted 35-45 minutes. I took notes to highlight important participants' descriptions. The interviews served as the basis for data collection, to clarify information shared, and to receive feedback from participants regarding the Dependability of the data collected (see Appendix N).

As the primary data collection tool, I employed open- ended questions to engage participants in a semi-structured interview format. Data was collected at the Head Start organization in a secure location to protect the privacy of participants. To increase the credibility of the findings, I triangulated the data through member-checking, ensuring participants confirmed recorded responses accurately reflected what was shared. The NVivo 10 data mining tool ensured descriptions were accurately recorded and transcribed into themes and patterns. The data collected was compared against corroborating data of Pre-k math like calendars, newsletters, and flyers.

Pilot Interview

One Head Start parent who did not participate in the final study participated in a pilot interview to determine the appropriateness of the interview questions and to allow myself to assess if the responses elicited by the parent sufficed to yield rich textual and structural descriptions (see Appendix Q). The interview served to inform if questions were understandable to the participant (Leedy & Ormrod, 2010). To obtain the pilot test participant, I derived the name from a parent roster of the Head Start agency and used the same sampling criteria established for the study. The pilot interview participant received

and signed the Informed Consent (see Appendix I) the Promise of Confidentiality form (see Appendix J) and received information on the processes of data destruction (see Appendix K).

Creswell (2009) suggested pilot test participants should receive a copy of the interview questions prior to the study to allow them time to reflect upon their experiences. Following the pilot interview, the participant received a matrix (see Appendix I) by which to assess the practicality and ease of the interview questions. Based on the participant's responses the interviewer changed several questions for ease of reading and to eliminate a duplicate (see Appendix S).

Demographic Information

The participants received a demographic setting form (see Appendix L). This form allowed participants to fill in basic demographic information, including age, level of education, number of children, children's ages. The parent was also asked to specify the length of time his or her child (ren) has been in the Head Start program.

Data Collection Procedures

Within the context of a qualitative research study three methods of interview processes are available – structured, semi-structured, unstructured (Creswell, 2005; Al Saggaf & Williamson, 2004). Each method allows participants to respond to open-ended questions. The methods vary in the delivery of questions to each participant. The variance in delivery may be the difference in the amount and quality of information shared as well as the difference in data collection procedures (Al Saggaf & Williamson, 2004).

Structured interviews involved presenting the same questions to different participants in the same order, but limiting the response categories (Al-Saggaff & Williamson, 2004). The benefit of this approach is the ease with which responses are categorized. The problem of this method is the inability of the respondents to express thoughts or feelings not necessarily related to the questions asked, but pertinent to establishing the meaning related to the phenomenon (Al Saggaf & Williamson, 2004).

Similar to the structured interview format, semi-structured interviews allow for the preparation of the interview protocol using pre-determined questions (Al-Saggaf & Williams, 2004; Creswell, 2005). Respondents are allowed the opportunity to respond to the questions freely adding information perhaps not requested, but deemed important to the researcher (Hancock, 2002). This particular method can also serve to validate the thoughts, feelings, and perceptions of disadvantaged populations (Tjitra, 2011).

The unstructured interview format reflects a conversational interaction between the researcher and the participant (Al-Saggaf & Williamson 2004; Creswell, 2005). Within the unstructured interview format, participants respond to the open-ended questions, guided by the researcher's specific interests. Although the unstructured interview format may yield rich content related to "individual differences, situational changes, and emerging new information" (World Bank Group, 2002, para. 3), capturing essential data related to the central question may be lost as well as the ability to accurately organize the data.

This phenomenological qualitative study employed the semi-structured interview format, to allow participant(s) to respond to a prepared interview protocol (see Appendix M). Because the goal of the study was to explore the awareness Head Start parents have

about Pre-k math resources, capturing responses not only to prepared questions, but also allowing for unexpected responses that may contribute to the meanings was important. The semi-structured interview format also provides an opportunity to validate the concerns, opinions, and perceptions of a disadvantaged group (Tjitra, 2011). Data collection procedures involved the use of a specific location, the explanation of recording equipment, obtaining consents, and verifying responses (see Appendix O).

Instrumentation

According to Neuman (2003), the qualitative researcher is the primary instrument of data collection. The quantitative researcher uses, among other things, comparative experiments, surveys, and statistical analyses as the primary instruments in data collection. The qualitative researcher employs the use of historical data, face-to-face interviews, and recordings to capture the meaning of experience as a function of culture, values, beliefs, and attitudes germane to a particular group of people or within a specified context (Moustakas, 1994). The qualitative process requires personal reflection on behalf of the researcher to expose biases, hidden values, and assumptions, which Creswell (2005) noted the researcher should include in the research.

This qualitative, phenomenological research employed in-depth interviews. Instrumentation chosen allowed for the open-ended responses by participants. Creswell (2003) noted qualitative interviews provide the opportunity for the researcher to ask and record open-ended questions. Participants interviewed face-to-face. The NVivo 10 software transcribed information from conversations with participants into words for analysis.

Participants responded to a questionnaire (see Appendix P) read aloud to ascertain the participants' knowledge and use of Pre-k math resources. I gathered information on parental knowledge of Pre-k math resources, how participants accessed resources in the school and community, and how participants engaged their children in math learning in the home environment. The questionnaire was designed to explore how participants access teachers and other school resources to increase their children's awareness of Pre-k math related activities, and to understand how participants use these resources in their children's daily lives.

The questionnaire helped uncover the knowledge parents have of various resources including government and private sector math initiatives targeted toward low-income Pre-k students. At least three Head Start administrators reviewed the items of the questionnaire for content validity. No recommended changes were made. A consistent process of data gathering helped establish dependability of the data to ensure the replication of the process with a different group of similarly situated parents, but in a different setting (Yin, 2003). In this qualitative phenomenological study triangulation of the data collection and data analysis strengthened the dependability of the study (Creswell, 2007).

The study employed non-probability quota sampling to purposively select 15 participants from a Head Start program of 301 parents located in Baltimore City, Maryland. Interviews continued until theoretical saturation was achieved, which according to Creswell (2007) can be achieved with between five and 25 participants in a qualitative method. Data gathering consisted primarily of face-to-face interviews, a common method utilized by qualitative researchers (Creswell, 2005).

Interviews provided a platform for participants to express their thoughts, feelings, understandings, and perceptions about their experiences without constraints (Vivar, Canga Armayor, Canga Armayor, 2011). Data from non- private archival documents corroborated the thoughts, feelings and understandings participants expressed about their awareness of Pre-k math resources. Throughout data collection, I was self-reflective and took note to consider my own subjectivity to the interview process, information received, and the analysis of the data (Creswell, 2007).

Participants interviewed face-to-face in a private setting within the organization for up to two sessions lasting a maximum of 45 minutes each. Participants responded to questions that were constructed based on research that pointed to communication problems among low-income families. For example, Payne (2001) suggested middle class systems have hidden rules that make accessing information frustrating for low-income parents. Therefore the question "Explain how you learn about math activities at your child's school" was designed to assess if parents sense frustration because of a lack of understanding about how to access resources. The pilot interview was used as a means to ensuring questions were culturally appropriate and reader-friendly. Participants' responses were transcribed. Content from the interviews were analyzed using the qualitative analysis tool NVivo 10, chosen instead of NVivo 9 that was proposed to be used in the original proposal of this document.

The tool was used to extract common themes and patterns among participants. NVivo 10 helped systematically structure the transcripts based on the codes assigned to the texts and yielded the frequency of codes (Datasense, 2008). The process uses

"objective and systematic counting and recording procedures to produce a quantitative description of the symbolic content in the texts" (Neuman, 2003, p. 311).

Data Analysis

The goal of this phenomenological study was to construct relevant themes and patterns from the textual and structural descriptions provided by participants. The data may help provide meaning to the awareness low-income parents experience regarding resources to improve their children's below average math (Creswell, 2005; Jordan, Kaplan, Ramenini, Locuniak, 2009) and subsequent overall academic outcomes. The study employed a modified van Kaam method to structure the analysis. The method includes seven steps:

- Listing and preliminary grouping (horizonalization);
- Implementing reduction and elimination;
- Clustering and creating themes of the invariant constituents (core themes);
- Identifying the invariant constituents and themes by application (validation);
- Constructing an individual textual description of the experience;
- Creating an individual structural description of the experience;
- Constructing textual structural descriptions of the meanings and experiences (Moustakas, 1994).

Data collection primarily consisted of face-to-face interviews involving audio-taped recordings. As noted previously, if participants felt uncomfortable at anytime during, prior, or after the interview, they were advised of their right to discontinue their participation without the threat of coercion, penalty, or explanation. The use of Dragon Naturally Speaking 11.5 voice-to-text recognition software allowed for accurate

transcription on some of the participants' responses; while the product failed to record accurately the responses of others. Twenty-eight pages resulted from the Dragon transcription. Petro (2011) recommended the use of Dragon Naturally-Speaking software 11.5, which reportedly required no training and was expected to be easy to install and administer. The software was noted to transcribe accurately and was expected to be easily manipulated to make corrections if needed.

As part of the data analysis, I used one of two face-to-face contacts to provide each participant with an opportunity to correct misinformation or misinterpretation on the transcriptions. Participants verified whether or not the transcribed responses accurately represented the responses they provided. I made corrections accordingly and also accessed the audio recordings to compensate for the loss in translation through Dragon Naturally-Speaking.

Rostvall and West (2005) noted the importance of including participant feedback on transcripts as transcriptions may not accurately reflect the interpretations. Participants were read their responses from the transcripts and were encouraged to give their feedback related to the accuracy. Changes were incorporated as needed. For ease of analysis and feedback, the NVivo 10 data-mining tool organized participants' structural and textual responses to allow for the emergence of clear themes and patterns (Rostvall & West, 2005).

Horizonalization the first recommended step in data analysis involves: recording, reading, describing, and understanding the lived experiences expressed by the participants (Clark, 2005). Creswell (2009) suggested the information shared related to the phenomenon should be understood through the process of isolating individual

components and attempting to understand the similarities and differences as a part of the whole. An important part of this process involves eliminating language or descriptions unrelated to the phenomenon, which allows what Clark (2005) calls the *invariant constituents* or core themes to emerge. The researcher should be able to relate the parts back to the whole.

The statements derived from transcripts were analyzed using text management software to allow the identification, management, and retrieval of specific data. The NVivo 10 software was used to cluster the data into statements and helped graphically sort the cluster of statements into themes and patterns (DataSense, 2008). According to Ryan (2004) the NVivo 10 software helps the researcher to explore all possible meanings associated with the themes and patterns produced through a process known as *imaginative variation* (Clark, 2005).

Themes and patterns derived from the individual responses allowed the researcher to produce composite descriptions. These descriptions reflected the awareness or lack thereof Head Start parents had about Pre-k math interventions. The descriptions further revealed how participants used or did not use interventions and exposed their knowledge about Pre-k math resources.

Credibility and Dependability

The judgment of the researcher and readers help establish the credibility of a qualitative study (Tong, Sainsbury & Craig, 2007). According to Trochim (2006) credibility is similar to internal validity in a quantitative study but uses participant's perspectives to establish the credibility or believability of results. Credibility deals with the accuracy of identifying and describing the subject of the study.

Tong et al. (2007) suggested a researcher's philosophical, professional, and intellectual biases can interact with and influence the interpretation of the results of a qualitative study. Tong et al. admonished that interpretation of themes derived from participant responses must reflect internal consistency. Moffett (2005) recommended five steps to establish consistency in the interpretation of participant responses, which include:

- acquiring direct, data collection from the participants;
- member-checking, which involves confirming with the participant what he or she said to be accurate;
- allotting ample time to gain an understanding of the research topic and devising a narrative account of the phenomenon;
- obtaining rich and substantial descriptions to report the findings, and replicating the study under dissimilar situations yet yielding similar themes

Internal Validity. Quantitative studies seek to establish causal relationships between variables. Qualitative researchers rely on the composite descriptions provided through individual participant's textual and structural descriptions of the central phenomenon and as a result the method of validating qualitative results necessarily differs from quantitative analyses (Trochim, 2006). Quantitative results rely on inter-rater reliability to establish internal consistency (Trochim, 2006). In qualitative studies, responses by participants to the same questions may vary, and thus credibility is paramount.

Creswell (2005) asserted researchers can limit the unreliability of data by ensuring interview questions are clear. Procedures used in the administration of the

instrument should not vary. Participants should not be able to misinterpret the meaning of the interview questions. This qualitative phenomenological study employed a pilot interview to help expose any points of confusion within the interview questions and the procedures related to administering the document (Leedy & Ormrod, 2010).

To avoid this and other threats to internal validity, Hefferman (2004) suggested the qualitative researchers use the following strategies:

- triangulation of the data,
- identification of how data was collected,
- verifying findings with participants, and
- comparing and contrasting themes with the literature

Creswell (2005) and Law et al. (1998) supported the use of triangulation or using more than three methods to validate results. Creswell suggested triangulation determines the validity of a qualitative study.

This study employed triangulation by a) collecting data from participants during the semi-structured interviews; b) comparing and transiting the emerging themes with the literature review; and c) analyzing publically available archival data and sharing findings with the research participants. Furthermore, this qualitative, phenomenological study established internal validity by synthesizing the composite descriptions gathered from the data provided by participants related to their awareness and use of Pre-k math resources among low-income Pre-k students in Baltimore, Maryland. Data was analyzed for internal validity by synthesizing the information gathered from the data on (a) knowledge of community resources, (b) understanding of Pre-k math learning opportunities, (c)

perceived barriers to engaging in math learning opportunities, and (d) knowledge of government, private and other sponsored math opportunities.

External validity. External validity in quantitative studies relates to the generalizability of findings to dissimilar settings, persons, and time frames, yet yielding similar results (Cooper & Schindler, 2003). Moffett (2005) noted the generalizability of a study can be applied to similar populations in different settings and yield similar results. The nature of qualitative studies reflects the perceptions, opinions, and beliefs of an individual or group, resulting in the meaning or essence of experience superseding generalizability to other groups or settings (Trochim, 2006).

Dependability. Unlike quantitative studies, qualitative studies do not focus on replication of results which establishes reliability, but rather on a concurrence among researchers and participants that results are sensible (Guba and Lincoln (1985, as cited in Creswell, 1998 and Trochim, 2006). Guba and Lincoln (1985, as cited in Creswell, 1998 and Trochim, 2006) proposed that the term dependability is analogous to reliability. Creswell (2005) suggested qualitative researchers should ensure interview questions are clear and understandable to participants to avoid producing unreliable data. The administration of the process and procedures should be consistent and not vary from one participant to another.

The researcher should remove the possibility for participants to misunderstand the meaning of interview questions. This qualitative phenomenological study employed a pilot interview to allow the participant to offer feedback on the interview protocol and procedures (Leedy & Ormrod, 2010). Any suggestions for improvement in the understandability of questions or procedures were integrated prior to the study.

Researchers may replicate the processes and procedures recommended for this qualitative phenomenological study, as there are Head Start agencies in every state within the United States and within every United States territory including Puerto Rico, the Virgin Islands, and North Samoa (National Head Start Association, 2011). Results may vary based on the cultural, demographic, and geographical locations. The uniqueness and individuality of human experience will also influence potential differences in outcomes. This qualitative phenomenological study attempted to achieve reliability by following systematic procedures in data collection and analysis.

Summary

Chapter 3 detailed the research design proposed for this qualitative, phenomenological doctoral dissertation study. Justification for the appropriateness of the design was presented. Descriptions of the population, procedures for establishing confidentiality of participants and obtaining informed consent, as well as presenting the sampling frame and data collection process were presented. Dependability and credibility were also discussed.

The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. A modified van Kaam method was adopted for the study. The significance of the research is the findings may help political and educational leaders better understand the knowledge low-income families have about Pre-k math resources and how the families access the community and

government-based math resources designed to assist parents in improving their children's math readiness.

Chapter 4 will detail the data compilation, analysis, and presentation of results. These results were derived from the transcribed and categorized composite textual and structural descriptions provided by Head Start participants. Details of the analysis explained the lived experiences of the participants, represented by the emerging themes and patterns. The goal of the data analysis is to capture the essence of the experience.

CHAPTER 4: Results

The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. Chapter 4 contains a detailed analysis of 15 face-to-face interviews, including transcripts from audio recordings of Baltimore, Maryland Head Start parents.

Included in the analysis are newsletters (see Appendix T). The study included a questionnaire (see Appendix P), rated by one Head Start parent from the study population to help determine the understandability of each question. Feedback from the pilot questionnaire informed the changes in the questionnaire which resulted in the revision (see Appendix P).

Data collected from participants' transcribed and recorded interviews produced emergent themes and subthemes related to the participants' knowledge of Pre-k resources and the integration of the resources into their children's daily lives. Participants responded to a set of 10 questions (see Appendix S). To determine the common themes, the analysis methods included: preliminarily grouping or coding recurring keywords and phrases. Some of the keywords and phrases included:

- I learn about Pre-k math
- I learn about math activities through the teacher
- I learn about math activities on the internet
- I learn about math through educational T.V.
- I trust the teacher

- I trust myself
- I trust the internet
- I am not sure or I don't know about
- Best Pre-k math learning resource
- My child's math skills
- Flyers
- Handouts

Through the process of reduction, phrases, like *I learn about*, and *I trust* were used as general nodes in which the decision was made to either eliminate or lump together related ideas. The node *I learn about* that housed phrases like I *learn about math through teachers*, *I learn about math through the internet*, and *I learn about math through educational T.V*" was then more broadly defined as General Knowledge of Pre-k math resources. This process was followed for each node until broadly defined themes emerged including: General Knowledge of Resources, Awareness of Pre-k math Impact on Academic/Career Success; Lack of Awareness of Pre-k Math Parent Support Programs; Experiences of Being Informed, and Math Integration through Active Play. The analysis of themes concluded with constructing a description of the experiences.

The research questions served as a guide to ensure a direct link between the collected data and analyzed results. The overarching research question was: RQ1: What do Head Start parents know about Pre-k math resources designed to improve academic outcomes?" Sub-questions in included:

RQ2: How do Head Start parents describe their experiences regarding being informed about Pre-k math based resources and activities in the Head Start program?

RQ3: How do Head Start parents describe their use of these or related resources in their children's daily life?

Within the context of the theoretical framework, the objective of the analysis was to explore how participants described their experiences obtaining information about Pre-k math resources and their understanding of how to use those resources. Qualitative data analysis included: (a) participants' demographic information, (b) transcribed semi-structured interviews, and (c) newsletters. The initial emergent themes included: general knowledge, awareness of Pre-k math impact on academic and career success, awareness of Pre-k math parent support resources, experiences of being informed, and math integration through active play.

Interviews took place in an empty classroom, used as a space for adult learners. The classroom, located in an adjacent building on the grounds of Head Start, was equipped with a chalk-board, folding tables, chairs, and what looked like donated items, including children's toys, cups, and furniture housed in the back of the room. Classes for learners appeared to take place regularly as lessons on the board related to reading, math, and accounting appeared to change daily. The room was set at a comfortable temperature, was well-lit, and situated at the end of the hallway to allow for privacy and quiet during the interviews.

Participant Demographics

All participants were residents of Baltimore, Maryland. Each participant had a child in the Head Start program expected to matriculate into Kindergarten during the 2013-2014 school year. All participants were at least 18. To protect confidentiality, participants' names were coded as HSP 1, HSP 2, HSP 3, and so forth.

Eight of the 15 (53%) participants were between 18 and 30. Six of the 15 (40%) participants were between 31 and 40 Thirteen of the 15 (87%) participants were female, and two of 15 (13%) were male. Twelve of 15 (80%) the participants were single, and three of 15 (20%) were either married or living with a significant other. Table 2 includes the personal demographic information of the 15 participants.

Table 2

Personal Demographic Information

HSP	Age	Gender	Marital Status
1	18	F	S
2	24	F	S
3	21	F	S
4	22	F	S
5	30	F	Mr
6	29	F	S
7	26	F	S
8	21	F	S
9	31	M	S
10	31	F	S
11	32	F	Mr
12	38	F	S
13	35	F	S
14	34	M	S
15	45	F	S

Note. Demographic breakout – Age - 18-30 = 53%; 31- 40 = 40%; 41-50 =1%; F = female - 87%; M = male - 13%; S = Single - 87%; Mr = Married - 13%.

Twenty-seven percent of the participants held a Bachelor's degree or higher, including a Master's degree. Thirty-three percent of the participants had some college experience including an Associate's degree. Forty-seven percent had an 11th to 12th grade education.

Seventy-three percent of the participants were employed. Five out of the 11 (45%) who were employed, held a jobs identified as Certified Nursing Assistant, Retail sales, Patient Care Tech, and Stock Clerk. Six of the 11 (55%) who were employed held higher wage jobs identified as Firefighter, Teacher, Trucker, and Corrections Officer. Four out of the fifteen participants (27%) were either unemployed or in school full-time. Table 3 describes participant occupation.

Table 3

Participant Occupation

Occupation Title	HW	LW	N
Teacher	X		3
Trucker	X		1
Firefighter	X		1
Corrections Officer	X		1
C.N.A.		X	3
Retail Sales		X	1

Stock Clerk	X	1
Patient Care Tech	X	1
Total		12

Note. HW=Higher Wage based on Federal Register 2012 showing workers who earn above $22,350 with an average of $26,000 annually. LW=Lower Wage - workers who earn between $16, 767 and $22, 350. Two participants were unemployed and one was a full-time student.

Data Analysis Procedures

Fifteen participants took part in the study using the revised interview guide (see Appendix P). Following the interviews, participants confirmed their transcribed responses through simple member checking procedures to ensure the accuracy of the transcribed data. At the same time participants checked their responses, some added information to help substantiate their answers. The added information was recorded and transcribed. The study involved transcribing audio recorded semi-structured interviews into a Word document by listening to each recorded interview and assessing the recordings against data obtained through Dragon Naturally speaking soft-ware. Recordings from Dragon Naturally speaking typed what participants spoke, but failed at times to capture the exact words spoken.

Once participants confirmed their responses, data was imported into NVivo 10 software. A new file entitled Head Start study was created. Initial coding began by running queries and word tree analyses on an initial code list developed based on keywords that emerged during the interviews. Based on queries NVivo 10 produced the frequency of the word or phrases which helped identify if the word or phrase was a node

into which similar words or phrases could be lumped or deleted. A determination was made about whether or not a theme or sub-theme had emerged.

Initial coding involved mining data from the source of 15 transcribed interviews imported into NVivo 10. Initial coding resulted in pattern matching and data reduction through which a series of key words or phrases determined the nodes or containers into which similar codes were grouped to eventually form the themes and subthemes. Certain nodes reflected terms or expressions that were similar in meaning and could therefore be grouped together. The themes and subthemes emerged from the final code list upon which the final analysis was completed.

The final steps after coding the interviews were ranking themes by order from most to least within the domain of each research question. Corresponding subthemes were likewise rank-ordered from most to least. Data analysis also involved importing into NVivo 10 transcribed data from Head Start Monthly calendars and newsletters dating from January 2012 to October 2012 (see Appendix T). These data was coded using pattern matching and data reduction.

The study included 15 participants who were Baltimore City, MD Head Start parents whose child or children were expected to matriculate into kindergarten in 2013. Prior to the study, an ad requesting participants for the study was mailed to the agency, which included my email and phone number. Due to logistical complications related to the agency posting the flyer in ample time for potential participants to respond, participants had to be pre-selected and interviewed onsite after teachers were instructed to notify potential participants of the study and to direct potential participants to the

designated interview room if interested. Results from the data analysis included five themes and 10 subthemes. The following section includes the data findings for the study.

Using NVivo 10, five major themes and 10 sub-themes emerged through the process of coding the responses of the 15 participants to 10 interview questions and analyzing and coding the monthly newsletters. Themes were rank ordered from most to least. Themes were corresponded to the research questions guiding the study.

Findings

From the transcribed data, participants' semi-structured interviews were coded by themes and subthemes from a final code list. Themes were then rank ordered from most to least. The study included five themes and 10 subthemes. Theme 1, General Knowledge of Pre-k math resources had three related sub-themes, including: Knowledge of Teachers as a Resource; sub-theme 2, Knowledge of the Internet as a Resource; and sub-theme 3, knowledge of T.V. as a Resource. Theme 2 - General Awareness of Pre-k math Impact on Future Academic/Career Success and Theme 3, Lack of Awareness of Pre-k Math Parent Support Programs, along with Theme 1corresponded to RQ1: "What do Head Start parents know about Pre-k math resources designed to improve academic outcomes?"

Theme 4 – Experiences of Being Informed had five related sub-themes, including: sub-theme 4, Formal Experiences; sub-theme 5, Informal Experiences; sub-theme 6, Most Trusted Resources; sub-theme 7, Reliance on Self through Personal Effort; and subtheme 8, Reliance on Professionals. Theme 4 and the related subthemes corresponded to RQ1: "How do Head Start parents describe their experiences regarding being informed about Pre-k math based resources and activities in the Head Start program? Theme 5 –

Math Integration through Active Play and the related sub-theme 10 – Reliance on Repetition corresponded to RQ2: "How do Head Start parents describe their use of these or related resources in their children's daily life?"

Themes

Theme 1: General knowledge of Pre-k math resources. General knowledge of Pre-k math resources included participants' awareness about Pre-k math resources and activities and helped answer: "What do Head Start parents know about Pre-k math resources designed to improve academic outcomes?" Fifteen of 15 (100%) participants identified some level of awareness of Pre-k math resources or activities. Participants expressed an awareness of the following Pre-k math resources: school-based (teachers), Internet resources, and T.V. Participants' frequent reference to teachers, the Internet, and T.V. as resources led to the subthemes knowledge of teachers as a resource, knowledge of the Internet as a resource, and knowledge of T.V. as a resource. Table 4 summarizes Theme 1 along with its subthemes.

Table 4

Theme 1 and Related Subthemes. Knowledge of Pre-k Math Resources

Theme	n	%
General Knowledge of Resources	15	100
Knowledge of Teachers	13	87
Knowledge of the Internet	11	73
Knowledge of Pre-k Math T.V.	9	60

Note. Some participants expressed having awareness of more than one resource.

Subtheme 1: Knowledge of teachers as a resource. Participants expressed an awareness of their children's teachers as a resource, a finding that held true across demographic groups, including: gender, age range, occupation, marital status, and educational level. The 87% of participants who identified their child's teacher as a primary resource, noted the teachers' commitment to exposing children to as many math opportunities as possible. Participants identified in-class work and home-work assignments as the most direct evidence of teachers providing Pre-k math information to their child. Table 5 illustrates the percentage of participants who shared teachers were their primary source of Pre-k math information.

Table 5

Demographic Breakout of Participants who Identified Teachers as a Pre-k Math Resource

Age Range	%
41-50	100
18-30	88
31-40	83
Gender	
M	100
F	85

Educational Level	
Some College Exposure or Higher	88
12th Grade and Below	86
Marital Status	
Single	83
Married (Includes LWP)	66
Occupational Status	
Unemployed	100
Higher – Wage	88
Lower – Wage	66

Note: LWP – Living with partner. Percentages are based on the number of participants within each demographic, e.g. There were a total of 8 18-30 year olds - 7 out of 8 (88%) said teachers were a primary resource.

Thirteen out of 15 (87%) participants identified teachers as their primary Pre-k math resource. HSP 8, a single, unemployed mother, with an 11th grade education, stated, "The teacher gives out worksheets and tells us to introduce the worksheets into our everyday life. The teacher also encourages us to use songs to teach our children math." HSP 8, an African-American female, who wanted to make known that her son was being raised by *two mommies*" advised she regularly volunteers in the program as a way to stay informed and to involve her partner in her son's math activities.

Participant HSP 3, also a single mother, high school graduate, in the 18-30 age range, and employed in a lower-wage occupation. Important to note is the initial

suspicion, this participant had entering the interview. After signing the informed consent, HSP 3 presented several questions about how the study was going to help her and her child. The participant appeared extremely tired and confirmed she had just gotten off work. When she was not satisfied that she or her child would directly benefit, she discontinued the interview; however, several hours later offered to complete the interview.

HSP 3 shared how she views her child's teacher as a resource for Pre-k math, stating:

> My son's teacher tells us what they're going to do throughout the day. My son gets monthly worksheets. Throughout the month we have different [math] homework activities we have to complete and turn in. We turn the workbook back in each day. Then she gives us extra stuff throughout the weeks and the days.

An outlier included HSP 7, a married female, with some college education, in the 31 to 40 age range, and employed in a lower-wage occupation. HSP 7 arrived to the interview with her infant and husband who allowed his wife to answer questions throughout the interview. Both participants presented as articulate and expressed they were willing to take advantage of any opportunities they had to teach their children math. Neither parent, however, appeared to have knowledge of their child receiving math activities or the teacher sharing information about math related work. HSP 7 stated:

> We do not learn about math activities at our child's school. As far as I know there are no math activities offered for parents or students. I'm not sure if they offer them in the classroom. To my knowledge the school does not offer information on Pre-k math programs or activities. The school really don't give math assignments.

> It's something we do on our own. We make sure the kids put things in patterns or in a certain order. We try to make sure that they count, know the time, can separate patterns and understand different order of numbers and objects to make sure that they understand counting.

Subtheme 2: Knowledge of the Internet as a resource. Participants expressed having knowledge of the Internet as a resource where they could retrieve information or engage their children in online activities that teach Pre-k math. Table 6 below illustrates across demographic domains the percentage of participants who expressed that the Internet was one of their primary sources of Pre-k math information and revealed what participants know about Pre-k math resources through the internet. Eleven out of 15 (73%) participants identified the Internet or online resources as their primary source of Pre-k math information. Table 6 illustrates the demographic breakdown of participants who expressed the Internet was one of their primary sources of Pre-k information.

Table 6

Demographic Breakout of Participants who Stated the Internet was a Source of Pre-k Math Knowledge

Age-Range	%
41-50	100
31-40	88
18-30	83
Gender	
M	100
F	85

Educational Level	
Some College and Higher	88
12th Grade and Below	86
Marital Status	
Married (includes LWP)	100
Single	83
Occupation	
Lower – Wage	100
Higher – Wage	88
Unemployed	75

Note: Note: LWP – Living with partner. Percentages are based on the number of participants within each demographic, e.g. There were a total of 8 18-30 year olds - 7 out of 8 (88%) said teachers were a primary resource.

Further mining of the data revealed while participants with college experience or degrees and those without appear to identify equally the Internet as a Pre-k math resource, participants with a 12th grade education or less expressed limited specific knowledge of Internet resources compared to participants with some college experience or degrees. Table 7 illustrates the knowledge participants had of specific Internet resources within the context of their demographics.

Table 7

Specific Knowledge of Internet Resources across Demographic Domains

Specific Internet Programs	Age-Range	Gender	Educational Level	Marital Status	Occupational Status	%
IXL/Superwhy	18-30	F	11-12th	S	Lower-Wage	29
Nick Jr./Khan	18-30	F	SC	M	Higher Wage	50
Academy/Superwhy	31-40	F	SC	S		
IXL/Everythingpreschool.com	18-40	F	B.A.	S		
Sprout	18-30	F	M.A.	S		

Note. IXL= The name of an educational internet program to reflect *I excel*. SC=Some College.

Only 29% of lower wage earners between the age of 18 to 30 with a 12th grade education or less were able to identify specific online programs and were more likely to make general references to the use of the Internet. Consider HSP 2, a single mother, with a high school education employed in a lower wage position, who stated, "On the Internet I found a program that taught him and had letters and numbers – it teaches kids their numbers using animals – you had to add the animals. That helped him a lot."

By contrast, 50% of higher wage earners, from age 18 to 30, with some college experience or a degree were able to specify Internet-based Pre-k math programs with a direct focus on Pre-k math skill development. HSP 6, a single mother, with a Master's degree expressed, "I learn about and use math activities at home by going online and using age appropriate activities through Nick Jr."

Lending support to the finding showing college educated participants had more specific knowledge of programs, HSP 4, a single mother, with a B.A. degree in the 18 to 30 age range shared, "I use different websites. One site is called

everythingpreschool.com." Four participants did not mention the internet as a resource. One of the four (25%), HSP 5, a single mother in the 18 to 30 age range, with some college education, but in a lower-wage occupation, expressly stated:

> I do not use the internet. I learn about and use math in my home by using workbooks that teach adding and subtracting. The way I look for ways or information to teach my child math at home is by going to different stores that have different math items.

Subtheme 3: Knowledge of Pre-k t.v. as a resource. Knowledge of Pre-k math T.V. as a resource was defined as parent awareness of television programs designed to improve Pre-k math skills. The theme included keywords like Dora the Explorer or Team Oomie Zoome, used by participants when describing the types of television programs to which participants expose their children to teach them math. Parent responses helped inform what participants know about Pre-k math resources through educational T.V. Nine out of 15 (60%) participants expressed educational television serves as one of their primary Pre-k math resources.

Younger vs. older. The data revealed important differences between older and younger participants with older participants identifying T.V. as a resource more than younger participants. Gender differences emerged as the two males in the study did not use T.V. as a resource, but 9 of 13 (69%) females did. More single participants (66%) than married participants (33%) identified T.V. as a resource. Although no remarkable differences emerged across educational status in the identification of T.V. as a resource, differences emerged in the amount and types of programs used by participants who were college exposed or had degrees versus participants without any college exposure.

HSP 2, a younger parent, 18-30 expressed, "T.V. seems like it helps a lot because that's what they be singing about on the cartoons. He remembers the songs a lot. There is no one specific program that teaches him. It seems like all the cartoons have a purpose of teaching them. Dora, Diego, Yo-gabba Gabba – are programs that I think teach my child math."

Married vs. single. Three of 15 (20%) participants in the sample were married. One of the three (33%) married participants (HSP 7) identified T.V. as a resource for Pre-k math. HSP 7, who expressed using T.V. identified both federally and non-federally funded T.V. programs like Sesame Street and Dora the Explorer, respectively. This parent was in a lower wage occupation with some college education, and in the 31 to 40 age range. Out of all the participants who expressed using T.V. as a resource, this parent had more specific knowledge of T.V. programs than did all the participants who expressed using T.V. as a resource. HSP 7 stated she and her husband expose their children, ages 3 and 4, to programs like Dora the Explorer and Sesame Street. HSP 7, expressing:

> We work together as a team to help both our children. We don't just let our children watch T.V. we explain what they are watching. We support each other, like if he comes up with a activity to help them learn more about what they just watched on T.V. then we work on that and vice versa.

Two out of three (66%) married participants did not identify T.V. as a resource, but instead referenced activities like board games, and counting out loud to reinforce math concepts. Consider HSP 13, who stated:

> We try to stay away from T.V. We try to pick up with what the teachers are doing at school. We use game-boards because the school use the game boards so that it is easier for him to comprehend. The school uses a board that has spaces on it that has different items like trucks, cars, strawberries etc. and then the child has to move the truck or strawberry the number of spaces so many spaces. So the numbers are written inside the board.

Eight out of 12 (67%) singles, on the other hand, expressed they use T.V. as a primary resource for Pre-k math information, citing Dora the Explorer, Team Oomie Zoomie, Sesame Street, Super Why, Little Einsteins, PBS, Yo Gabba Gabba, Diego, and Bubble Guppies as the primary programs. HSP 12, a single parent, stated:

> The names of the programs I think help my daughter the most with math is Dora the Explorer and two other programs I can't remember right now. My 6 year old daughter also helps her with her math because she is really good with numbers. My 6 year old can say her numbers in Spanish and teaches my youngest daughter to say her numbers in Spanish too. My child likes Yo Gabba Gabba as well.

Only 2 out of 12 singles (17%) expressed using federally funded programs, one of which was in a higher wage occupation in the 41- to 50 age range, and the other in a lower wage occupation, in the 18-30 age range. Eight out of 12 (67%) single participants expressed they used non-federally and federally funded T.V. programs like Dora the Explorer and Sesame Street as one of their primary sources of Pre-k math knowledge. Consider HSP 1, a single mother in the 31-40 age range with two years of college and in a higher wage occupation, who stated, "There are programs on T.V. like Team Oomie Zoomie, Dora the Explorer, Bubble Guppies, and other similar programs that teach my

child math." HSP 1 worked the night shift and recalled during the interview how tired at times she can be during the day, a factor that could contribute to her use of T.V. as a resource.

Females vs. males. Females made up 87% of the sample. Eleven out of 13 (69%) females expressed using T.V. as a Pre-k math resource compared zero out of two (0%) males. Both males were in higher wage occupations, in the 31-40 age range, married and with a 12th grade education. Like females, both males expressed they were heavily involved in their children's education.

Both appeared at the interviews dressed in their work clothes. One parent had just volunteered in his son's class prior to coming to the interview. He stated he often volunteers as a way of staying connected to what his child is learning in school and as a way for him and his wife to support learning in the home environment. In describing the resources he and his wife used to teach their child math, consider HSP 13s lack of reference to T.V.:

> I volunteer in his class and check his notebook for assignments and homework. Me and my wife count our change in stores and we count toys and other objects with him. We make our own flashcards and use repetition. We have him count lines, circles and other objects. We also use songs. We ask his teachers, look online and in educational books.

College vs. non-college educated. Five out of eight (63%) participants identified as having some college exposure or degree identified T.V. as a resource compared to four out of seven (57%) participants with a 12th grade education or less. No remarkable differences emerged between college educated and non-college educated participants in

the use of T.V. Further mining of the data revealed, however, four out of 8 (50%) of participants with some college education compared to the four out of seven (57%) of those without any exposure to college, appeared to have a greater awareness of T.V. programs that promote Pre-k math a specific knowledge of programs.

Three out of 8 (38%) college educated participants expressly stated having knowledge of federally funded programs like Sesame Street or Super Why. All three participants, who were female, had some college exposure or degree, and ranged in age from18 to 50. Two of the participants were in lower wage occupations, while the other was in a higher wage occupation. The same three participants had more extensive knowledge of additional Pre-k math programs beyond the federally funded programs than did their peers with a 12th grade education or less. HSP 5, for example, explained:

> I learn about different math activities by watching PBS, Dora, and other kids shows that teach math. I think these programs work well because my daughter learns math best when she can sing. The only activities that I think help teach my child math are the ones that involve songs. She learns when she can sing or if something has a rhythm to it.

HSP 7 added:

> The programs and activities that we think teach our children math is Einstein, Super Why, Sesame Street, and Mickey Mouse Club House. We think Super Why is the best because it teaches math ideas on T.V. and you can go online and what you see on T.V. you can see online. We try to look for ways to show them math ideas.

Table 8 illustrates the percentage of participants across demographic domains who expressed they use television as their primary source of Pre-k math information.

Table 8

Participants who Expressed Using T.V. as a Pre-k Math Resource

Age-Range	%
41-50	100
31-40	67
18-30	50
Gender	
F	69
M	0
Educational Level	
Some College and Higher	63
12th Grade and Below	57
Marital Status	
Single	66
Married (includes LWP)	33
Occupation	
Unemployed	75
Lower – Wage	66
Higher – Wage	63

Note: Note: LWP – Living with partner. Percentages are based on the number of participants within each demographic, e.g. There were a total of 13 females, 9 out of 13 expressed using T.V. as a Pre-k math resource.

Theme 2: Awareness of Pre-k math impact on academic/career success.

Knowledge of Pre-k math influence on academics and career success was defined as participants' awareness of how what their children know and understand about Pre-k math currently is directly tied to their child's future academic success and ultimate employability. The emergence of this theme helped expose what participants know and understand about how what their children are learning in Pre-k will affect their future academic success. Eleven of 15 (73%) participants stated they understood the connection between the Pre-k math skills their children were currently learning and the children's academic and work future. HSP 12 stated, "I believe the math my child is learning now is connected to her ability to get a high paying job in the future because knowing shapes and patterns will help her as she gets older to do more difficult math." Table 9 summarizes participants' understanding of the influence of Pre-k math on their children's academic success and future employability.

Table 9

Awareness of Pre-k Math Impact on Academic/Career Success

Parent Awareness of Pre-k Math Impact	N	%
Aware of Impact	11	73
Do Not Understand Impact	2	13
Unsure of Impact	2	13
Total	15	100

Theme 3: Lack of knowledge of parent support Pre-k math programs.

Knowledge of parent support programs for Pre-k math resources was defined as parent

knowledge of programs, like Parent Information Resource Centers (PIRCs), Parents as Teachers (PAT) that are designed to enhance parent knowledge and skills to improve their children's Pre-k math skills. This theme helped answer the RQ1: "What do parents know about Pre-k math resources to improve academic outcomes?" This theme emerged as a result of the recurrent phrase "I am not aware of programs". Eleven out of 15 participants (73%) expressed the school does not inform them about parent support programs to help improve their children's math skills. HSP 5, a single mother stated, "The school does not inform me about Pre-k math programs and activities in the community." Two out of 15 (13%) participants stated the school staff does inform them about outside programs; however, the participants did not name the outside programs. HSP 14, a married male in the 31-40 age range stated, "The school informs us about Pre-k math programs and activities through bulletin boards and hand outs and community meetings."

Theme 4: Experiences of being informed. Experiences of being informed related to how participants expressed the ways in which they were informed about Pre-k math resources. The theme helped answer RQ2: "How do Head Start parents describe experiences of being informed through the Head Start program?" Most participants described their experiences in terms that could be classified as either formal or informal. Terms like: teacher, school, newsletter, or calendar suggested formal experiences, whereas, terms like: Internet, aunt, T.V. and games, suggested informal experiences.

Thirteen out of 15 (87%) participants described their experiences as being formal. Participants described their formal experiences as including direct communication through teachers in the form of speaking to participants about in-class or homework

assignments. Indirect forms included receiving monthly calendars, newsletters, or flyers. Informal experiences included receiving information from family, friends, or exploring the Internet. Thirteen of 15 participants (87%) expressed some means of knowledge about Pre-k math resources or activities through informal experiences.

Subtheme 4: Formal experiences. Thirteen of 15 (87%) participants who expressed having formal experiences explained the school and teachers share information with them in the form of direct (teachers speaking to parents) or indirect (newsletters, calendars, chalkboard) communication. Ten of the 13 (77%) participants who noted having formal experiences expressed the school or teachers communicated through indirect or written means. Written forms of communication included information on the chalk board that described what types of math activities the children might be expected to work on for the day or throughout the week. Demographically, no remarkable distinctions emerged.

Participants described monthly newsletters or flyers that indicated the homework activities parents were expected to work on throughout the month, or flyers that may have advertised Pre-k activities. HSP 6 shared: "The school informs me about Pre-k math programs and activities through the monthly newsletter, and home learning, which is the monthly calendar." HSP1 added, "Every month the school puts their homework in the monthly calendar. The calendar lays out what they have to do for each week." Figure 2 illustrates the means of written communication participants identified.

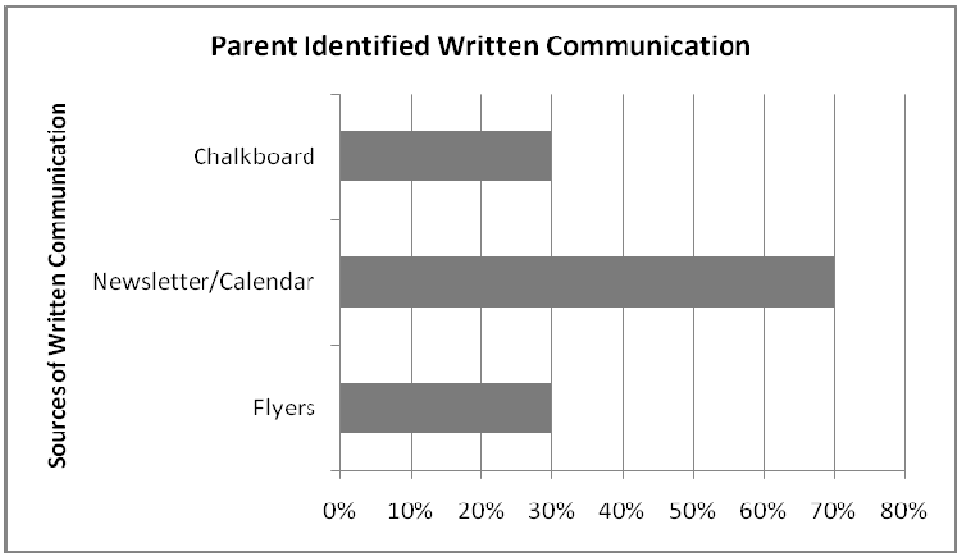

Figure 2. Parent identified Written Communication. This figure illustrates the three primary sources of written communication identified by participants.

Nine of the 13 (69%) participants expressed teachers use direct means to communicate with them. HSP 12, stated, "The teacher informs me about math activities my child is doing in the school." Seven of nine (78%) participants who expressed receiving Pre-k math information through direct communication confirmed teachers speak directly to them about what their child is working on in class. Two of the 9 participants (22%) stated teachers discuss homework assignments with them. HSP 3, a parent who expressed having trust in her child's teacher to share information stated:

> My son's teacher tells us what they're going to do throughout the day and my son gets monthly worksheets. Throughout the month we have different homework activities we have to complete and turn in. We turn the workbook back in each day. Then she gives us extra stuff throughout the weeks and the days.

Two out of 15 (13%) participants provided conflicting information regarding how they were informed by the school or teachers. HSP 15, a single unemployed female in college, in the 18-30 age range stated:

> Right now, since he just started, I don't know of any programs, but I am sure if the school offered information on Pre-k math programs I would find out in a newsletter. The math homework is in a monthly calendar. Each day it has on the calendar what we should do with our children at home.

In this example, the parent expressed dual messages: the school does not provide information on Pre-k math programs, but does provide math homework in the monthly calendar. Adding to the discussion, HSP 4, a college educated, single female, in a higher wage occupation, in the 18-30 age range expressed:

> The school informs me about Pre-k math programs and activities by sending home worksheets. But the school does not give out math information and resources, but my child's teacher focuses on math. The way I use materials given to me by the teacher is to make it homework. We do the homework together, but I instruct him on how to do it.

Demographically, there was no difference between respondents, outside of their education and occupational statuses. Responses from HSP 4 and HSP 15, however, differ from 2 out of 15 (13%) participants who stated the school does not communicate with them about any math related activities. Consider HSP 2, a single, female, lower wage earner, with a 12^{th} grade education, in the 18-30 age range, who stated:

> I don't normally get math homework. I have been looking for him to come home with some stuff. He just started in September. They haven't been doing math.

> The teacher sends him home with homework that he can study and that I can teach him. But right now they don't have any math homework.

In support of HSP 2, HSP 7, a married female, with some college experience, and in the 31 to 40 age range noted, "We do not learn about math activities at our child's school. As far as I know there are no math activities offered for parents or students. I'm not sure if they offer them in the classroom."

Subtheme 5: Informal experiences. Informal experiences as noted previously was defined as the informal ways in which participants described how they were informed about Pre-k math resources. Informal experiences included knowledge that was obtained through self-created activities, exploring the Internet, or accessing family members with stronger academic backgrounds. The use of keywords: Internet, educational T.V. and other family members led to subtheme 3. Thirteen out of 15 (87%) participants who stated they had informal experiences, reported they create their own types of learning experiences to teach their children math. HSP 11, a single female, lower wage earner stated:

> I'll ask her to pass me 10 beads when I do her hair and I have her count them. She will ask for a certain number of pizza rolls. I will sometimes give her more or less just to see if she can figure out that I didn't give her what she asks for. She can tell if I gave her more or less. With math I like to feel her out to see the best way to make her enjoy learning math. Once I know how she likes to learn then I can teach her.

Eleven of the 15 (73%) participants expressed the Internet is their primary means of knowledge. HSP 3 stated, "We go to websites that teach counting and addition."

Other sources of informal means of knowledge, included: educational T.V. (47%), store-bought activities (40%), other family members (38%), and word of mouth (1%). Table 10 illustrates the informal experiences and means of knowledge identified by participants.

Table 10

Participant Identified Informal Experiences of Obtaining Pre-k Math Knowledge

Types of Informal Experiences	n	%
Parent Self-Created	13	87
Internet	11	73
Educational T.V.	7	47
Store-bought Activities	6	40
Other Family Members	5	38
Word of Mouth	1	7

Note. Some participants expressed having more than one informal experience of obtaining Pre-k math information.

Based on the discussion of the types of experiences participants had in obtaining information about Pre-k math resources four subthemes emerged based on repeated references to parents, teachers, and the Internet, which included: trusted resources, reliance on self, reliance on professionals, and reliance on technology.

Subtheme 6: Most trusted sources. In describing their experiences of being informed, participants repeated phrases like *I most trust* to describe who in their experiences they most trust to provide them with math information for their preschooler. The emergence of this sub-theme corresponded to RQ2 in that responses exposed rich descriptions of trust issues related to the experiences of being informed. Ten out of 15

(67%) participants stated they most trust the school or teachers. Figure 3 illustrates which demographic group expressed teachers were their most trusted resource for Pre-k math information.

Trust in Teachers across Demographic Groups

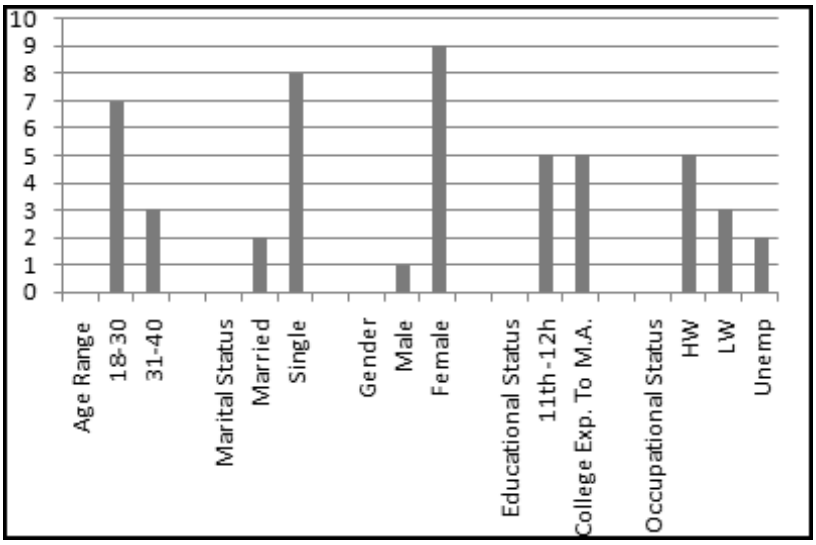

Figure 3. Trust in teachers. This figure illustrates the demographic breakdown of participants who expressed they trusted teachers.

Findings showed (70%) of younger participants age 18-30 compared to (30%) of older participants of older participants age 31-40 expressed they trusted teachers to provide them with Pre-k math information. HSP 8, for example, stated, "I trust the school, the faculty and the family coordinator to help me find the information I can use to help improve my child's math skills. They have a good curriculum." HSP 2 shared:

> I trust the teacher because she's gonna keep him on the right track. The reason I got him into this school is because kids come out of this school and be smart. Other programs are like day care and they don't learn much but here they learn hands on stuff to help them learn their math. So I trust the school.

Eight out of 10 (80%) of single participants compared to two out of 10 (20%) married couples expressed they trusted the teachers, although given there were only three married couples in the sample it is difficult to draw a conclusion. HSP14, a married male, stated "I first and foremost trust us as parents. We are the most important teachers, but I also trust the school and his teachers.

Nine out of 10 (90%) females compared to two out of 10 (20%) males expressed they trusted teachers as a primary resource for Pre-k math information. Five out of 10 (50%) participants with college experience or degrees expressed they trusted teachers as much as those without college degrees. Five out of 10 (50%) higher wage earners compared to three out of 10 (30%) lower wage earners and 2 out of 10 (20%) unemployed expressed they trusted teachers.

Five out of 15 (33%) of participants expressed the Internet was one of their most trusted sources of Pre-k information. Younger participants age 18 to 30 expressed the Internet was their most trusted source compared to 1 out of 5 (20%) older participants age 31-40. HSP 3, a parent between 18 to 30 expressed:

> I think what I trust the most is the Internet because I'm able to go on and Google what should my child be learning at 4 or 5 and I trust this the most to help keep him on the right path of learning. I let him use my Ipad to get information about interactive math games that are on IXL. You can pick different age groups that's appropriate. I always pick one level up from his age.

All participants who expressed they trusted the Internet as one of their primary sources of Pre-k information were single females. The males in the sample, all of whom were married, did not express that the internet was a trusted source. Participants with

some college exposure or a degree expressed they trusted the Internet more than did participants with less than a college education. No significant differences emerged between occupational statuses.

Figure 4 illustrates the differences in participants' expressions of trust for the internet across demographic domains.

Internet as a Trusted Resource

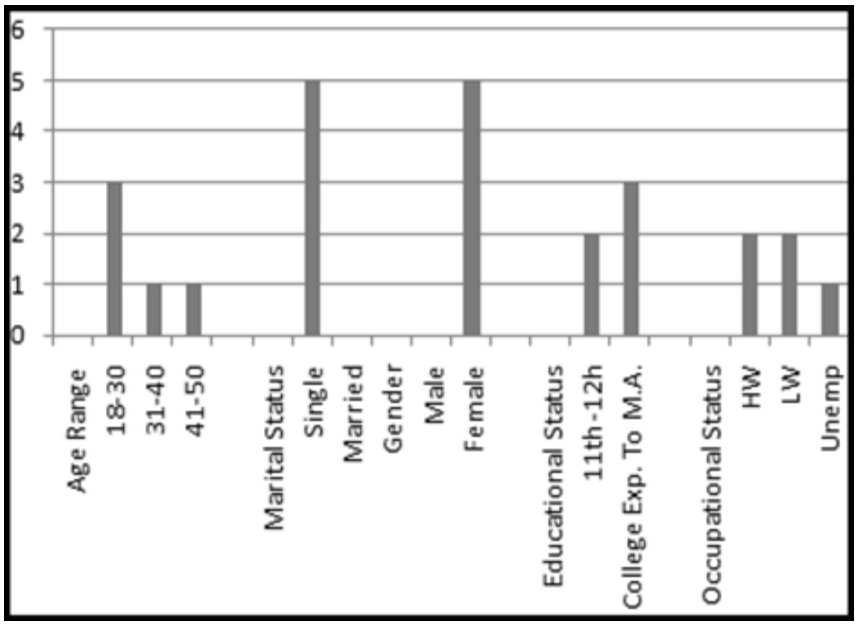

Figure 4. Internet as trusted source. This figure illustrates the demographic breakdown of participants who expressed they trusted the internet as a resource. Note - HW – higher wage occupation – $26, 821 - 29,055 LW – lower wage occupation 16, 767 – 22, 350 , (Federal Register by the U.S. Department of Health and Human Services under the authority of 42 U.S.C. 9902(2), 2011).

Four out of 15 (27%) participants expressed they trusted themselves to provide their children with Pre-k math information. Three out of four (75%) older participants

compared to one out of four (25%) stated they trusted themselves. HSP 11, a younger parent stated:

> I trust myself to get and use math information that will help my daughter because I know I want my daughter to go far and because I work in Walmart, I have access to flashcards that I know I will use with her. She has a learning computer too. I want to get her books that are interactive. I want to get her some books with math. I do trust the teachers but I trust myself better.

In support of HSP 11, HSP 9, an older single female added:

> I feel that being as though I am the foundation of his learning and because the school and the parent work hand-in-hand, if the school is teaching my son math concepts it's very essential for the parent to be in on it as well. Because a child is like a sponge they're constantly learning they're constantly grasping themes. If the school is teaching him starter math concepts, when he comes home, as a parent, I have to sit down with my son and help him with homework on a daily basis you know helping him to understand the math concept. It is my job as well to sit down with him on a daily basis so make sure that he's getting what he needs from all the resources. Resources can be effective especially if the child's parent don't have strong supports like myself - like resources like a tutor or a mentor, church resources, positive males and stuff like that.

Subtheme 7: Reliance on self through personal effort. In describing experiences of being informed, the sub-theme Reliance on Self through Personal Effort emerged and was defined as the personal actions participants took to inform themselves about Pre-k math resources. Participants identified personal information seeking behaviors like

asking the teachers about math activities for their children, volunteering in the classroom, duplicating in-class lessons in the home, printing age-appropriate worksheets from the Internet, and using interactive Internet-based activities. Fifteen out of 15 (100%) participants expressed a reliance on themselves through their own personal effort to locate Pre-k math resources.

Eleven out of 15 (73%) participants shared they explore the Internet as one of the primary means for exercising self-reliance in locating Pre-k math resources. Data mining revealed more females compared to males expressed exploring the internet for math resources. More participants in the 18-30 age range compared to older participants in the 31 to 50 age range expressed their use of the Internet to educate their children. More college educated participants compared to participants with less than a college education explained they use the Internet as well as a Pre-k math resource. Table 11 illustrates the array of activities in which participants engage to explore Pre-k math resources for their preschoolers.

Table 11

Personal Effort to Obtain Pre-k Math Knowledge

Types of Personal Effort	n	%
Exploring the Internet	11	73
Parent Inspired Ideas	8	53
Asking Teachers	5	33
Reading Books	5	33
Purchasing Educational Games	4	27
Exploring Educational T.V.	4	27
Asking Family Members	4	27

Volunteering	2	13

Note. Some participants expressed exercising multiple forms of personal effort to obtain Pre-k math information.

The 15 out of 15 (100%) participants who expressed most of their knowledge derives from their own self-creativity or parent inspired ideas expressed they draw on their prior knowledge from childhood to create math-related games based on what they think their children should know. Figure 5 illustrates the demographic breakdown of participants who expressed they used parent-inspired or self – creativity to introduce their preschooler to math concepts.

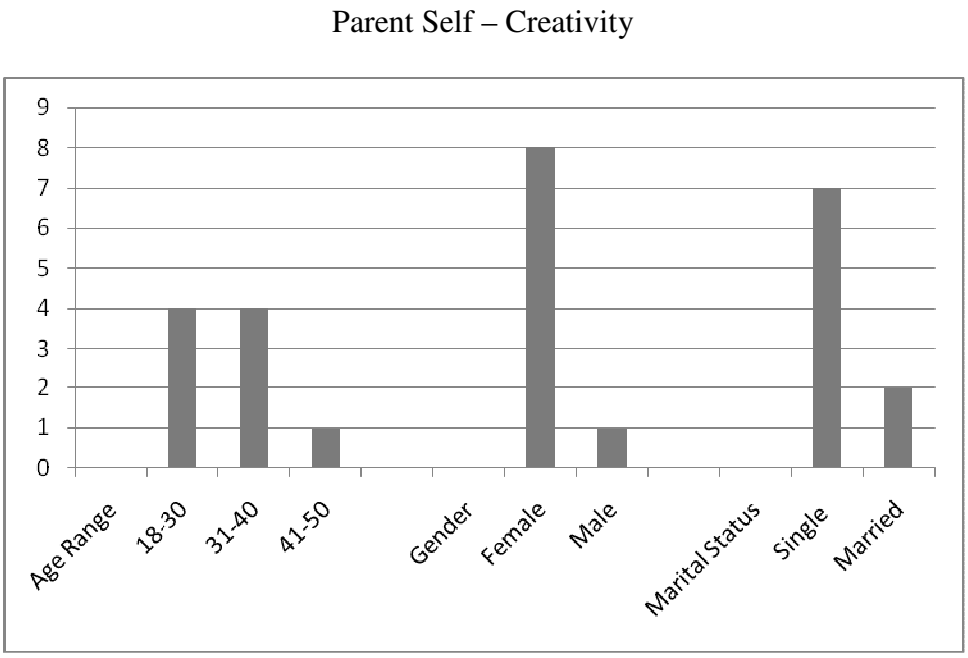

Figure 5. Parent self – creativity. This figure illustrates the demographic breakdown of participants who expressed using parent inspired ideas. Note: only two males and married couples were in the sample.

Four out of nine (44%) participants in the age group 18-30-and 31 to 40 compared to one out of 9 (11%) participants expressed using their own self-creativity to teach their

children math. Eight out of nine (89%) females compared to one out of the 9 (11%) participants who was a male expressed using self creativity. Seven out of nine (78%) single participants compared to two out of 9 (22%) married, explained they used self-created activities to inspire their children to learn math. Consider HSP 8 a single female, who stated:

> When he is getting dressed, we count his two feet and I teach him this is a pair. When he puts his shoes on I teach him two shoes is called a pair. When he puts his pants on, I teach him it is called a pair because he has to put his two legs in. I teach him addition by telling him one leg + one leg = 2 legs. He asks questions about numbers and we give him answers. We use his bowling balls and pens to help him learn his numbers.

HSP 14, a married male expressed, "Me and my wife count our change in stores and we count toys and other objects. We make our own flashcards and use repetition." Table 12 illustrates the self-created activities participants stated they designed to teach their children math.

Table 12

Reliance on Self - Parent Self-Created Pre-k Math Activities

Types of Self-Created Activities	N	%
Counting Out loud	4	27
Cooking and Measuring	4	27
General References to SC*	3	20
Making Flashcards	2	13
Making up Number Songs	2	13

Playing Store –Cashier/Customer	1	7

Note: General References to SC (Self Created) Participants made statements like "I make up my own activities. Some participants expressed using more than one activity listed above.

Subtheme 8: Reliance on professionals. In response to participants describing their experiences of being informed, the sub-theme Reliance on Professionals emerged. Thirteen out of 15 (87%) participants expressed the school and teachers serve as one of the primary formal sources of information about Pre-k math knowledge. Participants expressed a strong reliance on teachers to provide them with specific Pre-k math activities or resources regardless of demographic domains. Resources and activities participants stated teachers encourage them to use with their children include: learning to tell time, math functions like adding and subtracting, counting forward and backward, and number recognition. HSP 9 stated, "I talked with his teacher in reference to how math relates to what the kids are learning on a day-to-day basis and I have her actually sometimes explain activities by going into more depth." An outlier was HSP 7 who stated, "The teachers do not provide parents with any information."

Table 13 rank orders the Pre-k math activities about which participants stated teachers or the school informs them.

Table 13

Formal Experiences via Teachers and School

Types of Formal Experiences	n	%
Adding/Subtracting via BG/S*	6	23
Counting Forward/Backward	2	15
Telling Time	2	15
Number Recognition	1	8

Simple Word Problems	1	8
Manipulatives/Fingerplay	1	8

Note. BG/S=Board-games/Songs.

HSP 13, a married male, with a 12th grade education, stated, "The school uses a board [game] that has spaces on it that has different items like trucks, cars strawberries etc. and then the child has to move the truck or strawberry so many spaces." Not all participants agreed the school or teachers inform them about Pre-k math activities or resources or even provide their children with math homework. HSP 2 stated:

> I don't normally get math homework. I have been looking for him to come home with some stuff. He just started in September. They haven't been doing math. The teacher sends him home with homework that he can study and that I can teach him. But right now they don't have any math homework.

Subtheme 9: Reliance on technology. Participants expressed their experiences of being informed involved a reliance on the internet and technology. Eleven out of 15 (73%) participants identified their primary source of Pre-k math knowledge as coming from the Internet, or other technologies like the Apple Ipad or electronic games. Keywords, such as Internet, online, and websites in conjunction with the phrase "I use the Internet" led to the emergence of subtheme 9, reliance on technology. This means participants identified online games, worksheets, articles, and the like to teach their children how to count, recognize numbers, shapes, and sizes.

Eight out of the 11 (72%) participants who identified the Internet as their primary source of Pre-k math knowledge made general references to online resources. HSP 6, college educated, single female stated in the first portion of her interview, "I learn about

and use math activities at home by going online and using age appropriate activities." HSP 2, a single female, with a 12th grade education, added, "On the Internet I found a program that taught him letters and numbers – it teaches kids their numbers using animals – you had to add the animals. That helped him a lot."

Although 72% of the participants made general references to their use of the Internet, by using phrases like, "I go online and look up activities" three of the 11 (27%) named specific websites and the math skills taught on each site. As noted previously, the three participants had some college experience or had obtained their degrees, all were females and single. Although HSP 6, made a general reference to her use of technology, she later specified the online resources by stating, "I learn about and use math activities at home by going online and using age appropriate activities through Nick Jr., KHAN academy, and Sprout." Additional websites mentioned by participants included, IXL and everythingpreschool.com. Other technologies mentioned during the interviews included the Apple Ipad, and Leapfrog.

An interesting finding included HSP 3, one of the single female, lower wage earners, with a 12th grade education, who stated, "We have an Ipad and he does activities on this. We go to websites that teach counting and addition." The participant's education and income status might have served as indicators that she may not have access to such advance technologies as an IPad.

Three participants did not mention the Internet as a source of information. HSP 5, a single, younger (18-30) female, with some college education, but in a lower-wage occupation, is considered an outlier, as she explicitly stated, "I do not use the Internet". Five of 15 (33%) participants expressed a sole reliance on the Internet to provide them

with the most accurate Pre-k information. Another outlier was HSP 10, a single, college educated, older (41-50) female, in a higher wage occupation, who expressly stated, "I trust the Internet only because I can go to a website and look up the most up-to-date information about what math skills my daughter should know at her age."

Theme 5: Math integration through active play. Math integration through active play was defined as the way participants integrated Pre-k math knowledge into their children's daily lives through activities that allowed the children to use their hands and creative abilities to interact. The theme resulted from keywords and phrases like, "I let him play with me", "She helps me measure", "We count out loud" and helped answer RQ3: "How do parents integrate Pre-k math activities into their children's daily lives?" These phrases suggested the way participants integrate math knowledge is by allowing their children to engage in some form of play that involves counting. Keywords included: hands-on, counting objects, finger-play, cooking, and playing store. Fifteen of 15 (100%) participants expressed they integrate math skills into some form of play. HSP 7 stated, "We count with them. We go over numbers. We count steps, cars, how many times, how many colors…" Other examples included: measuring, clapping, finger-play, or online games.

Subtheme 10: Reliance on repetition. Reliance on repetition was defined as participants' repeated use of counting activities like counting steps, shapes, colors, fingers and feet and emerged based on participants' repeated reference to counting activities that involved the key phrase "go over until he/she gets it". Twelve out of 15 (80%) participants expressed they use a variety of counting activities to integrate math knowledge into their children's daily lives. Fifteen out of 15 (100%) participants

identified self-created games and activities like counting steps or fingers. HSP 9, a single, college educated, female in the age range of 31 to 40, shared:

> When I learn about his math activities I sit down one-on-one with my son. I count with him, teach him shapes, numbers – I get scratch sheets of paper, we go over it until he gets the concept. We practice things that are on his level for him to understand it and then we will go over it, until he actually grasp the concept. Then I'll kind of test to see exactly where he is on different concepts. I try not to just keep going over it but I try to make learning math fun for him and fun for myself.

Table 14 illustrates the ways participants integrated math knowledge into their children's daily lives.

Table 14

Integration of Pre-k Math into Daily Life

Types of Activities	n	%
Self-Created Games	15	100
Counting Objects	12	80
Math Games Online	5	33
Cooking (Measuring)	4	27
Flashcards	4	27
Counting on Fingers	3	20
Singing Number Songs	2	13
Counting Numbers on a Clock	2	13
Clapping	1	7
Playing Store (counting money)	1	7

House-play sorting laundry/noodles	1	7
Board Games	1	7
Visiting the Library	1	7

Note. Some participants expressed use of several activities to integrate math.

Corroborating Evidence

Analysis of monthly newsletters. Analysis of intermittent monthly newsletters and calendars including January 2012 through October of 2012 confirmed the school notifies participants of monthly homework assignments and activities including math they can do with their children and helped answer RQ1: "What do Head Start parents know about Pre-k math resources to improve academic achievement?" The Education Chit-Chat section of the October 2012 newsletter, evidenced how parents were provided with information on the various ways preschoolers learn the different aspects of math. For each aspect of math, including number sense, geometry, measurement, math language, and spatial relations, participants were provided real-world games and activities they could do with their children.

Some suggested activities cited in the newsletter included: "count food items at snack time". Use a calendar to count down the days to a birthday or special holiday. Help your child see the connection between a numeral like '5', the word 'five', and five days on the calendar. Play simple board games."

Summary

Data findings supported themes that addressed the overarching question and two sub-questions. The overarching question was "What do Head Start parents know about Pre-k math resources designed to improve academic outcomes?" The two related

questions were (a) How would you describe your experience regarding being informed about Pre-k math based resources and activities in the Head Start program; and (b) How would you describe your use of these or related resources in your child's daily life?

Data analysis, included: semi-structured interviews and analysis of publically accessible archived newsletters and monthly calendars. The themes included (a) general knowledge of Pre-k math resources, (b) awareness of Pre-k math impact on future academic and career success, (c) lack of knowledge of Pre-k math parent support resources outside of Head Start, (d) experience of being informed, and (e) math integration through active play.

The first theme, General Awareness reflected participants' general awareness of Pre-k math resources, including the school, the Internet, and television. From participants' discussions about various television programs emerged the subtheme awareness of television programming that promotes Pre-k math development. The subtheme related to the specific knowledge participants had about federally and privately funded T.V. programming like Sesame Street and Dora the Explorer respectively.

Federal programming included shows featured on the Public Broadcasting Service (PBS), specifically Sesame Street and Super Why because participants who stated they use these shows expressed they felt the shows offered their children the best opportunity to learn math. Private programming, like Dora the Explorer and Team Oomie Zoomie were the most frequently cited programs because of the programs' strong focus on math skills. Participants specifically noted Team Oomie Zoomie strictly teaches math skills.

The second theme, Knowledge of the Influence of Pre-k math on Academic and Career success reflected most participants recognized the need for early math to aid their

children in later academic and career success. Most participants were future focused regarding their children's academic success. Four participants either did not see or were not sure about the connection between Pre-k math skills and their child's future academic success.

The third theme, Lack of Knowledge of Pre-k Math Parent Support Programs reflected parent's lack of knowledge about Pre-k math parent support programs outside of Head Start. Participants either stated the school did not inform them about such programs, or that the school does not provide those types of resources. Participants did affirm the Head Start program offers parents a wide range of support including allowing parents to volunteer, ask questions, and take part in meetings that include discussions about the curriculum.

The fourth theme, Experiences of Being Informed, reflected the different experiences participants had in receiving information about Pre-k math information through formal and informal channels. Formal experiences included being informed by the school through monthly newsletters and calendars, whereas, informal experiences involved exploring the Internet, enlisting the help of family members, and using educational television. From participants' discussions about their formal and informal experiences emerged four subthemes including: most trusted resources, reliance on self through personal effort, reliance on professionals, and reliance on technology. Participants expressed their caution with trusting all the sources of information they explore which led to the subtheme *trust*. Participants agreed they trust teachers followed by the Internet to provide them with the most accurate information to help assist their child's math skill development.

The subtheme, Reliance on Self through Personal Effort, reflected participants' reliance on themselves to create math activities for their children. Activities include things like counting steps, shapes, or money. All participants expressed they exercised some form of personal initiative to assist their children, including volunteering in their child's classroom in an effort to understand and apply the skills the teacher was teaching and to understand how their child processed the skills.

The sub-theme, Reliance on Professionals, reflected participants' reliance on teachers to provide them with information, like encouraging participants to count forward and backward with their children, teaching their children how to recognize numbers on a clock, and sharing with participants ways to do simple math functions like adding and subtracting. *The reliance on technology* subtheme included participants who accessed the Internet or other technologies like the Apple Ipad to obtain Pre-k math information.

The fifth theme, Math Integration through Active Play, reflected participants' efforts to engage their children in learning math concepts through play. Participants relied on numerous activities including counting out loud, which was the primary activity, to allowing their children to assist in cooking activities like using the measuring cup. Participants' consistent use of activities that revolved around repetitive counting activities led to the subtheme, Reliance on Repetition.

Chapter 5 includes a discussion about the lessons learned from the study including the gaps in the research. Chapter five contains a discussion about the findings and interpretations of themes, subthemes, and corroborating evidence within the context of the theoretical framework. Chapter five also reviews and answers the research questions. The chapter concludes with implications and recommendations for educators,

administrators, and political leaders in assessing ways to improve knowledge about Pre-k math parent support programs in and outside of the Head Start agency.

Chapter 5: Conclusion

Recalling a statement made by South Korea's President Lee regarding the relentless demand of the parents in his country for excellent early education, President Barak Obama re-stated, "Even if somebody is dirt poor, they [parents] are insisting that their kids are getting the best education," (CQ Transcripts Wire, 2009, para 35). The academic and career success of children, including, Head Start children in the twenty-first century, is in large part dependent upon how well educated and demanding parents are about acquiring knowledge of foundational skills required for their children's success (Kent & Davis, 2011). A strong foundation in math skills will pave the road for broad social and economic opportunities for all children (Duncan, 2011; Duncan, et al., 2007, Romano et al., 2010).

The purpose of this qualitative phenomenological study was to explore Head Start parents' awareness about Pre-k math resources in a Head Start program in Baltimore City, Maryland. The study also explored the lived experiences of Head Start parents' attempts to integrate these resources into the lives of their children. The qualitative approach allowed for the exploration of the thoughts, feelings, and attitudes Head Start parents assign to their experiences related to obtaining and using Pre-k math knowledge.

Chapter 5 includes findings and interpretations of the data including themes and subthemes, corroborating evidence, implications, and recommendations. Findings and interpretations include a synthesis of 1) the themes and subthemes, 2) literature review, 3) the purpose of the study, and 4) the research questions. Implications include how the research may assist educational leaders within Head Start and political leaders.

Recommendations include suggestions for political and educational leaders and opportunities for future research.

Findings and Interpretations

The findings for the study are significant in offering insights into what Head Start parents know or do not know which can influence whether or not parents act on available information to benefit their children. Results not only revealed what participants across demographic groups knew about Pre-k math resources, but how they used the specific resources to ensure their children's academic success. Because little is known about how Head Start parents expose their children to Pre-k math resources, or how they may integrate these resources into their children's daily lives, the results of the research are significant in helping educational and political leaders understand how certain programs are or are not reaching intended audience.

Duncan, et al. (2007) stated early math skills serve as the strongest predictor for future academic success. Information about the Pre-k math resources, including teachers, online, T.V., and parent support programs abounds in online forums and in hard copy. Access to the information is a matter of awareness and communication about the benefits of the programs to parents and children. In the study, participants expressed using online educational forums, often without direction from teachers, but through personal effort to obtain information about Pre-k math resources.

The study contained five themes and 10 subthemes. The five themes included, general knowledge of Pre-k math resources, awareness of Pre-k math impact on academic and career success, lack of knowledge of Pre-k math parent support programs, experiences of being informed, and math integration through active play. Triangulation

of the themes and subthemes occurred through semi-structured interviews and archived newsletters and calendars.

Theme 1: General knowledge of Pre-k math resources. General knowledge of Pre-k math resources is important in establishing foundational knowledge for deeper exploration of specific math resources (Tudge, 2008). Knowledge of resources historically has been problematic among low-income groups (Altschul, 2012; Cooper et al., 2009; Gatlin, 2008) and yet is an important factor in the successful outcome of all children (Duncan, 2011; Duncan et al., 2007; Duncan & Brooks-Gunn, 2000; Pomerantz, Moorman & Litwack, 2007; Tudge, 2008). In the study, 15 of 15 (100%) participants identified some level of awareness of Pre-k math resources or activities, contradicting findings in the literature revealing low-income parents lack awareness of resources (Altschul, 2012; Gatlin, 2008). Findings from the current study suggests low-income parents, including Head Start parents, have been broadly labeled in the literature as lacking knowledge since it is established in the literature low-income parents have knowledge problems (Smith & Ashiabi, 2007; Tudge, 2008).

Subtheme 1: Knowledge of teachers as a resource. The 87% of participants who identified their child's teacher as a primary resource, noted the teachers' commitment to exposing children to as many math opportunities as possible. Participants identified in-class work and home-work assignments as the most direct evidence of teachers providing Pre-k math information to their child. Participants who expressed knowledge of teachers as a resource provided insight into the lived experiences regarding how they receive information from teachers. More participants identified as single, higher wage, college educated males and females expressed they viewed teachers as a resource compared to

fewer married, low-wage earners. Possible reasons for married couples viewing teachers as less of a resource, is married couples may have more internal support systems within the marriage and extended family than do single parents (Rafferty & Griffin, 2010).

Lower-wage earners may lack trust in teachers as a resource related to what researchers in the literature labeled cultural barriers (Bruton & Robles-Piña, 2009) or a lack of trust in the middle-class school system (Payne, 2001; Lott, 2001). Although internal supports within marriage, like having one parent available to do homework if the other is working, is beneficial, married couples, especially those within the low-income, should access teachers and other external resources to enhance their knowledge of Pre-k math to benefit their children. Regarding the low-income, the school system should ensure that low-wage earners never sense that because of their economic status there is a barrier between them and the resources they need to ensure their children's academic success.

When parents are actively engaged with teachers and informed how to instruct their children in learning, their children's achievement improves notably (Klein et al, 2008). Findings from the current study support one of the goals of Head Start's Family Engagement in Transition (FET) sub-domain of the Parent Family Community Engagement (PFCE) framework which is to ensure parents view teachers as a primary resource for their child's academic outcomes.

Subtheme 2: Knowledge of the Internet as a resource. Knowledge of the Internet as a resource is central to expanding parents' knowledge base (Knight, 2005) about Pre-k math resources outside the Head Start agency. Participants' regular use of the Internet supports the literature that suggests low-income families rely heavily on the Internet in

seeking information to improve their life outcomes (Knight, 2005). Although 11 of 15 (73%) participants identified the Internet or online resources like Sprout online, and IXL as their primary Pre-k math resource, only four out of the 15 (27%) could specify the names of the programs. These four participants also expressed using the internet less often than their non-college educated peers, but reported more specific information, like the names of the programs, and the types of activities offered on each program. The four participants were single and married females, with some college exposure or degree, and ranged in age from 18-50. Participants with a 12th grade education or less expressed limited specific knowledge of Internet resources.

Despite predictions of the digital divide which forecast low-income families would be at a disadvantage to their more affluent peers in accessing technology (Barrett, 2010), the low-income participants in this study reported regular access to the Internet. The exception was one parent HSP 5. HSP was a single, female, lower-wage earner, with some college exposure, in the 18-30 age range, who expressly stated, "I do not use the Internet." This was a surprising result considering the literature states that even among low-income the need to seek information leads the use of public facilities like the library (Knight, 2005). HSP 5 did not expound on her reason for not using the internet, other than she prefers to use books, and toys to teach her son.

Consistent with the literature is the association between educational status and awareness use of resources (Altschul, 2010; Gatlin, 2008). Although the college educated participants in the sample used the internet less, they knew more about targeted programs designed to improve Pre-k math skills. Participants with less than college degrees need to be as specific in their knowledge of online resources that specifically

target the development and enhancement of Pre-k math skills. In fairness, the lack of specificity about resources could have been due to an inability to recall the names of the websites at the time of the interview or could suggest a larger problem related to the acquisition of specific knowledge about resources.

Subtheme 3: Knowledge of Pre-k t.v. as a resource. Significant to providing low-income parents with information and resources is the knowledge they have of Pre-k math T.V. as a resource (Zucker, 2009). Sesame Street, for example, a Pre-k education T.V. program, was originally designed to primarily reach low-income children whose parents lacked access to formal Pre-k programs (Zucker, 2009). In 2009 the Federal Government invested $7.5 million into Sesame Street's Pre-k math program. Nine out of 15 (60%) participants expressed educational television, primarily privately funded programs like Dora the Explorer and Team Oomie Zoomie serve as their primary Pre-k math resources. Four out of 15 (27%) participants expressed knowledge of federally funded programs, with only 2 of 15 (13%) specifying Sesame Street.

The data revealed important differences between older and younger participants with older participants expressing they use T.V. as a resource compared to younger participants, who expressed less use of the T.V. This difference may be likely due to the increased use of technology by younger participants who can access educational programs online (Cummins, Brown & Sayer, 2008). Younger participants may not be aware of the math resource provided through the Sesame Street program because of the increased use of technology. Exposing the value of Sesame Street to all parents is especially important considering $7.5 million funds the Federal Government has invested in the development of math literacy programs (Zucker, 2009).

Gender differences emerged between males and females in the study. Two out of two (100%) males did not use T.V. as a resource, compared to 9 of 13 (69%) females who did use T.V. as a resource. The result was surprising as findings in the literature do not support an association between gender and the use of educational T.V.

More single participants (66%) than married participants (33%) identified T.V. as a resource. The difference again may exists because of the internal supports between married couples and extended families, compared to the more limited supports that can often affect single parents (Rafferty & Griffin, 2010). The findings suggests, married couples, because of their support system, can rely less on external stimuli like the T.V. to occupy their children, compared to single parents who may use the television to occupy their child. Although no remarkable differences emerged across educational status in the identification of T.V. as a resource, differences emerged in the amount and types of programs used by participants who were college exposed or had degrees versus participants without any college exposure. These results were surprising and not found in the literature.

College exposed participants identified more federally funded programs like Sesame Street and SuperWhy, than did their non-college exposed peers. The findings suggests that while Sesame Street may produce programming that can improve Pre-k math skills, low-income parents may not view the programming, possibly due to their lack of awareness of increased dependence on technology to access educational programs. The finding may also suggest that PBS no longer understands the needs of its audience making the less valuable to the target market. Funding for programs like Sesame Street, therefore, may be ill-placed for reaching the targeted audience.

Regardless of age range, gender, educational, occupational, or martial status, the knowledge participants stated they acquired through teachers, the Internet, or T.V. reflected only a small fraction of the Pre-k math knowledge required for successful Kindergarten entrance. The gap between what participants know and what they need to know for their children's success may have significant negative impacts for their children's academic outcomes. Based on the Head Start Content Standards and Early Learning Framework (2007), children should possess among other things: the ability to associate quantities with names of numbers; identify the number of objects without counting; use the last number in a set of objects to identify the total number of objects; and recognize that numbers or sets of objects can be combined or separated to make another number.

Thirteen out of 15 (87%) participants expressed they believed their children's math skills were good. Their responses however, revealed the knowledge gap between what they know and what they need to know. Consider HSP 8, who stated, "My son's math skills are excellent because he can count from 1 to 20. He knows what comes before and after. He can add things together. He remembers what he learns and can count in Spanish. Adding to the discussion, HSP 6 shared:

> I would say her math skills are good because she counts to 30 on her own she is remembering what number comes before and after and she can count how many colors are in an object. Her one to one correspondence is good.

Critical to closing the knowledge gap is making parents aware of the standards so they cam make adequate judgments about their child's academic status prior to entering Kindergarten.

Theme 2: Awareness of Pre-k math impact on academic and career success.

Parental awareness of the link between Pre-k mathematics and academic and career success is critical for success in the twenty-first century (Castells, 2011). This theme emerged as the result of a question posed to participants regarding their awareness of how their children's Pre-k math knowledge may influence their children's academic success. The question was posed based on literature that suggested low-income parents lack focus on future events and outcomes (Akers, 1998).

The literature suggests low-income parents are less focused on future events due to the impacts of poverty (Akers,1998; Bartfeld & Ahn, 2011; Payne, 2001), and more concerned with meeting the immediate needs related to food and shelter. Eleven out of 15 (73%) participants stated they understood the connection between the Pre-k math skills their children are currently learning and the impact on future academic and career success. This finding suggests low-income parents are able to be future focused and they are aware of future impacts on their children's academics and career.

Parent awareness of the impact of Pre-k math skills on future success does not ensure they know the exact resources needed to ensure that success (Tudge, 2008). Consider HSP 12, who stated, "I believe the math my child is learning now is connected to her ability to get a high paying job in the future because knowing shapes and patterns will help her as she gets older to do more difficult math." The response illuminates the parent's awareness of the importance of Pre-k skills, but the lack of specific knowledge of resources and activities to improve Pre-k math and later performance.

Theme 3: Lack of knowledge of parent support Pre-k math programs.

Knowledge of parent support Pre-k math programs is critical to the successful access to

and integration of Pre-k math resources into a child's learning experiences (McCormack, 2010). With knowledge issues appearing to affect the degree to which low-income parents access and use resources (Cooper et al., 2009; Dearing et al., 2009), low-income populations likely do not benefit from programs that promote Pre-k math. Uncovered in the literature was a host of parent support programs that provided, among other things, Pre-k math resources like Parent Information Resource Centers (PIRCS) (U.S. Department of Education, 2012), Parents as Teachers (PAT) (2010), and Home School Instruction for Preschool Youngsters (HIPPY) (2012).

Eleven out of 15 participants (73%) stated the school does not inform them about resources related to parent support programs that provide Pre-k math information and assistance to parents outside of Head Start that. Eleven out of 15 (73%) participants, however, did agree they received Pre-k math resources from within the agency. The results may lend support to findings in the literature suggesting informing low-income parents about valuable resources is wasteful as the group is perceived as lazy and not likely to use the additional resources (Harris & Jenkins, 2012; Mullhausen & Lips, 2010). Findings in the literature, however, suggest, Head Start provides parents with needed supports that often dissipate once parents and their children leave the program and enter their zoned public school (Zigler, et al., 1982).

Among the Head Start parents who agreed they received Pre-k math information from their child's teacher, all agreed the source of the information was from within the Head Start agency in the form of workbooks and monthly calendars. Participants who expressed the school shares Pre-k math information is consistent with the FET sub-domain of the PFCE framework (USDHHS, 2011) and reflects an engagement of

meaningful exchange between the agency and parents. The findings could reflect Head Start's confidence in its own curriculum, which since 2001, was redesigned from a sole focus on social and emotional development (Ludwig & Miller, 2008), to a greater emphasis on math, science, and logic and reasoning (Office of head Start, 2010). The revised curriculum may be robust enough in its math component that exposing parents to external Pre-k math programs may not be viewed by the agency as warranted. The findings could also reflect teachers' or the agency staff's lack of awareness about external resources like parent support groups promoting Pre-k math development.

Theme 4: Experiences of being informed. Understanding how participants describe their personal experiences of being informed about Pre-k math resources can help inform leaders about what information parents are receiving, how they feel they are receiving the information, from whom, in what contexts, and when. Payne (2001) suggested people from a lower-income social status may describe their experiences as being hindered or obstructed. They may not understand the language and hidden rules of the middle-class institutions and related individuals who are responsible for communicating important information.

In addition to class divides, predominantly white institutions may contribute to low-income and minority parents' perceptions of information-obstruction (Bruton & Robles-Piña, 2009). Fifteen out of 15 (100%) participants described various experiences related to being informed about Pre-k math resources. Contrary to the literature, participants did not express the perceptions of information-obstruction or hindrance. Participants instead expressed experiences that reflected an open flow of communication between themselves and the school staff. Six subthemes emerged from parent

descriptions of their experiences: formal experiences, informal experiences, most trusted resources, reliance on self through personal effort, reliance on professionals, and reliance on technology.

Subtheme 4: Formal experiences. Within the context of the learning environment, formal experiences by way of direct teacher-parent communication are important to establishing the legitimacy and authenticity of the flow of communication and information (Lott, 2001). Low-income parents tend to feel devalued by the middle-class driven school system and often describe their experiences as frustrating (Payne, 2001). All teachers in the Head Start program were African-American and therefore could relate at least from a racial and cultural standpoint to the parents they served, who were also African-American.

Cultural differences between parents and the school system have been noted in the literature to serve as a barrier to communication (Brown & Low, 2010). Findings from the current study contradict findings suggesting communication barriers exist between low-income populations and the middle class school system (Payne, 2001). Thirteen out of 15 (87%) participants expressed the school staff, including teachers, shared information with them in the form of direct (teachers speaking to parents) or indirect (newsletters, calendars, chalkboard) communication. HSP 3 stated:

> My son's teacher tells us what they're going to do throughout the day and my son gets monthly worksheets. Throughout the month we have different homework activities we have to complete and turn in. We turn the workbook back in each day. Then she gives us extra stuff throughout the weeks and the days.

Ten out of 13 (77%) participants expressed teachers speak directly to them about math related activities involving their children. Demographically, distinctions emerged between groups based on education levels and occupational status. Eight out of the 10 (80%) participants who stated teachers speak directly to them had between an 11th and 12th grade education compared to two out of 10 (20%) participants with college degrees. This result was surprising as findings in the literature did not reveal a relationship between the education status of low-income or Head Start parents and the ways in which parents are informed by teachers or the school system. Why the relationship has not been explored is unclear.

Six out of 10 (60%) participants identified as lower-wage earners compared to four out of 10 (40%) who were higher wage earners, expressed teachers speak directly to them. Findings suggest teachers may be aware of the learning barriers experienced among parents with less than a college education and were lower wage earners compared to four out of 10 (40%) who were higher wage earners. This result is consistent with findings in the literature that suggest low-income, based on the cultural practice of verbally sharing information within their family or social groups (Bishop, et al., 1999) prefer to receive information through spoken means compared to print mediums (Knight, 2005; Chatman, 1991). Important to the successful involvement of parents in developing their child's Pre-k math skills is a teacher's ability to distinguish which format of communication best registers with the parent.

Seven out of the 13 (54%) participants (five of which also expressed they received their information through direct means), stated they received information through indirect or written means, like newsletters, or monthly calendars.

Demographically no remarkable differences emerged between groups. Important to note, however, two out of 15 (13%) participants expressed the school did not provide them with any information on Pre-k math resources. Both participants were single females, with some college exposure, in lower wage occupations. One parent was married and the other single. HSP 7, a married parent noted,

> I have been looking for him to come home with some stuff. He just started in September. They haven't been doing math. The teacher sends him home with homework that he can study and that I can teach him. But right now they don't have any math homework.

Data from these participants are considered outliers given 87% of participants agreed the school provides them with Pre-k math information. There is no clear explanation as to why these participants feel they do not receive information from the school. Corroborating evidence from the October 2012 Education Chit-Chat, directs parents to engage their children in specific math activities. The overall findings support the school aligned closely with its FET sub-domain of the PFCE (USDHHS, 2011) framework for ensuring parents are informed through multiple means of communication.

Subtheme 5: Informal experiences. The informal experiences participants exercise to gain knowledge about Pre-k math resources is important in supporting the knowledge they obtain through formal systems, like the school system. Low-income parents are resourceful and demonstrate creativity and perseverance even in the face of limited resources (Cheadle, 2008, Cooper et al., 2009). Cheadle (2008) noted low-income parents through concerted cultivation are motivated and have high expectations of their children. Parents will seek out information and create opportunities for their

youth to learn, negating the effects of poverty. Findings supported the literature showing 13 of 15 (87%) participants, who expressed having informal experiences, reported creating their own types of learning experiences to teach their children math. HSP 11 stated:

> I'll ask her to pass me 10 beads when I do her hair and I have her count them. She will ask for a certain number of pizza rolls. I will sometimes give her more or less just to see if she can figure out that I didn't give her what she asks for. She can tell if I gave her more or less. With math I like to feel her out to see the best way to make her enjoy learning math. Once I know how she likes to learn then I can teach her.

Based on the discussion of the types of formal and informal experiences participants had in obtaining information about Pre-k math resources, four additional subthemes emerged: trusted resources, reliance on self, reliance on professionals, and reliance on technology.

Subtheme 6: Most trusted sources. Trust is an important factor in determining whether or not parents will use information they receive. Findings in the literature revealed low-income parents tend to lack trust in formal sources like teachers and school systems (Knight, 2005) and rather trust more informal channels of communication like family members or friends. HSP 1 stated, "I trust the teachers because I can go to them anytime and get the resources I need. They research things for me if I need it."

The findings in the study contradicted the findings in the literature showing 10 out of 15 (67%) participants explicitly stated they trusted the teachers to provide them with information about Pre-k math resources to benefit their children's academic outcomes.

Eighty-seven percent of participants expressed they relied on teachers. The reason for this contradiction may lie in the fact all teachers in the program were African -American females as were most of the participants in the study. Participants may have culturally and racially identified with teachers, where participants felt they could trust teachers simply because they were African American (Mendez, 2010).

Subtheme 7: Reliance on self through personal effort. Reliance on self through personal effort is critical especially within low-income communities as access to educational resources may be difficult due to limited financial resources (Gatlin, 2008; Starkey & Klein, 2008). Participants who are motivated toward successful outcomes for their children will create and seek out opportunities for their children (Cheadle, 2008; Cooper et al., 2009). Fifteen of 15 (100%) participants expressed a reliance on themselves through their own personal effort to locate Pre-k math resources. Eleven of 15 (73%) participants expressed they explore the Internet as one of the primary means for exercising self-reliance to locate Pre-k math resources. All participants who expressed most of their knowledge derives from their own self-creativity noted they draw on their prior knowledge from childhood to create math-related games based on what they think their children should know. HSP 8 expressed:

> I will give him a row of 10 pennies. Every day he counts the pennies. I use the pennies to teach him what number comes before and which comes after. Now he can do this on his own. The best activities he is learning comes from us teaching him at home not programs on T.V. or anywhere else.

The results support findings from information seeking behavior (ISB) literature suggesting participants rely more on themselves and those within their social network

than on more formal channels (Bishop et al., 1999; Knight, 2005; Spinks & Cole, 2001). Findings also showed 15 out of 15 (100%) participants rely on themselves compared to 13 out of 15 (87%) who rely on professionals. The result suggests participants exercise their own information seeking abilities as much as they rely on teachers' professional knowledge and assistance. Parents are self-motivated and willing to explore avenues to benefit their children, an attribute that can be capitalized upon by the education system and aided by teachers who should have knowledge of resources outside the Head Start program.

Subtheme 8: Reliance on professionals. Central to establishing a trusting and productive relationship between parents and professionals is for parents to know they can rely on professionals (Masse & Barnett, 2002, Reynolds & Ou, 2011; Temple & Reynolds, 2007; Schweinhart, Barnes & Weikart, 1993). Thirteen out of 15 (87%) participants described experiences where they relied on teachers to provide formal instruction on how to engage their children in learning math. HSP 9 shared, "I talked with his teacher in reference to how math relates to what the kids are learning on a day-to-day basis and I have her actually sometimes explain activities by going into more depth."

This result is contradictory to findings in the literature revealing low-income parents have a strong distrust of authority figures (Knight, 2005) or low-income parents perceive language, cultural, economic, or racial barriers between themselves and the middle-class professional (Bruton & Robles-Piña, 2009; Lott, 2001; Payne, 2001). Demographically, no real distinctions emerged between groups, however, as noted previously, two participants out of 15 (13%), (considered outliers), stated the school or

teachers failed to inform them about Pre-k math activities or resources or to even provide their children with math homework. HSP 2 expressed:

> I don't normally get math homework. I have been looking for him to come home with some stuff. He just started in September. They haven't been doing math. The teacher sends him home with homework that he can study and that I can teach him. But right now they don't have any math homework.

The reasons for this perception on behalf of the two participants are elusive. Eighty-seven percent of participants expressing they rely on professionals for Pre-k math information lend support to one of the goals of the FET, to have an open communication between parents and teachers.

Subtheme 9: Reliance on technology. Reliance on technology to inform knowledge about Pre-k math resources is critical given the number of online and technology-based resources readily available to those with access to these technologies. Research suggests that although low-income groups rely on the Internet and other technology-based resources (Knight, 2005), many in the group lack access to these resources and likely cannot maximize their knowledge of the resources due to their low educational attainment. The findings in this study, showing11 out of 15 (67%) participants rely on technology, contradict the findings in the literature that revealed low-income families lack access to technology (Barrett, 2010; Collins & Halverson, 2009; Cummins et al., 2008; Martin, 2007). This difference may exist as a result of parents having access to computers in the library. HSP 7 stated:

> The way we learn about and use math in our home is through the library. We get most of our math activities or online there. But the activities online seem to be

for older children. We have done the math activities online but again they seem all to be for older children.

Parents may also use their cell phones to access math games online. Fifteen out of 15 (100%) participants had cell phones at each interview. One out of 15 (.07%) participants, an outlier, referenced the use of an IPad. Interesting to note, this parent (HSP 3) had a 12th grade education, between 18-30, single, and in a low-wage occupation. I did not ask how the participant obtained the Ipad and she did not explain.

Knight found low-income participants preferred the Internet over formal channels of information because low-income groups distrust information coming from more formal sources, like authority figures. Knight (2005) suggested low-income populations perceive information from more formal sources as irrelevant. The findings in the current study reflect 67% of participants rely on the internet compared to 87% who rely on teachers, and 100% who rely on their own personal creativity and efforts.

Demographically, differences emerged between college educated and non-college educated participants. Eight out of 11 (72%) non-college educated participants did not name the online resources they used but made general references like "I go online" compared to three out of 11 (27%) college educated participants, who specified the names of the online programs. This finding appears to align with findings in the literature that revealed people with more education have greater awareness and use of resources (Altschul, 2010).

Regardless of education status the finding is clear participants rely on technology to expose their children to Pre-k math. Helping parents acquire the specific knowledge of online programs that specifically target Pre-k math development is central to helping low-

income children succeed. Participants' general references to resources could have been due to a lack of in-depth knowledge about the available resources, or could reflect the participants' inability to recall the names of the resources at the time of the interview.

Theme 5: Math integration through active play. Math integration through active play is important to the reinforcement of Pre-k math concepts (Welsh et al., 2010). Welsh noted activities like board games reinforce math concepts especially among children from low-income populations. The use of math language in everyday activities has been found to be an effective means for reinforcing math concepts among Pre-k children (Benigno & Ellis, 2008). Benigno and Ellis (2008) suggested low-income families likely fail to use math language in everyday activities with their children.

Findings showed 15 of 15 (100%) participants expressed they integrate math skills into some form of play through activities that allow the children to use their hands and creative abilities to interact. Participants also expressed the use of math language in everyday activities, HSP 7 explained, "We count with them. We go over numbers. We count steps, cars, how many times, how many colors." The subtheme reliance on repetition emerged based on participants' repeated reference to counting activities that involved the key phrase "go over until he or she gets it."

Subtheme 10: Reliance on repetition. Understanding Head Start parents' reliance on repetition such as repeated use of counting activities like counting steps, shapes, colors, fingers and feet, is important. The findings revealed the teaching mechanism by which most participants in the study population attempted to reinforce math concepts. Twelve out of 15 (80%) participants expressed they use a variety of counting aloud activities to integrate math knowledge into their children's daily lives. It's important to

look at what parents believe works for their children against evidence based models for the same group (Masse & Barnett, 2002, Reynolds & Ou, 2011; Temple & Reynolds, 2007; Schweinhart, Barnes & Weikart, 1993).

Corroborating Evidence

Analysis of monthly newsletters. Observation of intermittent monthly newsletters and calendars included January 2012 through October of 2012 (see Appendix T). The presence of the newsletters and calendars confirmed the school's commitment to the FET sub-domain of the PFCE framework (USDHHS, 2011) showing the school notifies parents of monthly homework assignments and activities including math activities parents can do with their children. The Education Chit-Chat section of the October 2012 newsletter contained information about Pre-k math, including: number sense, geometry, measurement, math language, and spatial relations. Each term was defined and then a real-world examples provided. Consider the following excerpt:

> Number Sense: The understanding that numbers represent quantities and have ordinal properties (number words represent a rank order, particular size, or position in a list). Examples include: "Count food items at snack time. Use a calendar to count down the days to a birthday or special holiday. Help your child see the connection between a numeral like '5', the word 'five', and five days on the calendar."

The presence of the newsletter confirms the experiences of the 73% of participants, who described receiving information from the school in the form of newsletters and calendars. A surprising finding was the use of advanced language possibly considered potentially difficult to understand by some parents with less than a

college education. One example is in the definition of number sense, where the phrase *ordinal properties* is used. The use of advanced language in the newsletters, contradicts findings in the literature suggesting more favorable approaches to reaching low-income families is to simplify language and communicate verbally (Knight, 2005; Chatman, 1991). The use of the more advanced language may signify the agency's attempt to avoid presumptions simply because Head Start parents are often low-income with an average 10th grade education (Office of Head Start, 2011), they cannot understand. The language used could indicate the agency assumes parents do understand.

The calendars and newsletters did not contain information about resources like parent support programs, online websites, or television programs that promote Pre-k math development. The absence of this information may be the result of Head Start's inclusion of math, science, and logic and reasoning (USDHHS, 2011) into its curriculum. In addition to a focus on social and emotional development, the agency has established goals to develop, in part, stronger foundational math skills (Office of Head Start, 2010).

The agency does have a parent support component where parents can learn about and contribute to discussions about the curriculum and other resources. Only two out of 15 (13%) participants, however, referenced parent teacher groups or community meetings where they can contribute to the curriculum or requests additional resources. Consider HSP 8, a single, female, with an 11th grade education:

> Parents can talk to teachers about what they want to see in the classroom. We actually have a say in what we want to see in the curriculum. The specific activities they have shared with us recently is how to work with our children

telling time on the clock. At the PTA we get information about anything that is very helpful. Anything we need help with the teachers will find.

Regardless of the agencies inclusion of math into its curriculum, or its own parent support program, sharing information about supplemental resources, can only help parents and their children achieve success.

Implications

Head Start parents in the study were highly motivated toward successful outcomes for their children, using the general knowledge they acquired through formal and informal channels. Participants who had some exposure to college had more specific knowledge about internet and T.V. resources than their peers who had a 12^{th} grade education or less. This implies for children of less educated parents to be successful in acquiring Pre-k math skills, the Head Start agency should provide additional assistance to these parents in the form of verbally sharing and explaining how to use resources. Using elements of the CMM theory, teachers might check for understanding with parents during episodes of communication.

Participants in higher wage occupations, like firefighter, teacher, trucker, expressed teachers and the Internet were their primary sources of Pre-k math information compared to lower wage participants, who expressed more use of the Internet as a primary source of information. Lower wage earners also expressed less trust in teachers than did their higher wage peers, but a greater reliance on teachers than higher wage peers. This finding implies a possible economic and cultural barrier (Mendez, 2010) exists between lower-wage parents and teachers.

Taking into consideration the greater portion of parents served by Head Start are low-income, teachers and administrators should take every measure to ensure parents feel a sense of trust in teachers and the information they share. Using tenets of the CMM theory teachers should ensure the intent and attitude through which they communicate information to parents (speech acts) respects the culture and education levels of parents (cultural patterns) (Cronen & Pearce, 1982).

Parental knowledge obtained through teachers, the Internet, or T.V. reflected only a fraction of the knowledge parents need to ensure their children's success in math and other academics. Based on the Head Start Content Standards and Early Learning Framework (2007), children should possess the ability to associate quantities with names of numbers; identify the number of objects without counting; use the last number in a set of objects to identify the total number of objects; and recognize that numbers or sets of objects can be combined or separated to make another number.

Thirteen out of 15 (87%) participants expressed they believed their children's math skills are good. HSP 8 stated, "My son's math skills are excellent because he can count from 1 to 20. He knows what comes before and after. He can add things together. He remembers what he learns and can count in Spanish." The findings suggest Head Start parents have limited knowledge about the standards against which their children are measured, and may believe the knowledge their children have is sufficient for academic success. This suggests Head Start leaders must make every parent aware of the Head Start Content and Learning Standards by posting the standards and using them in parent teacher meetings when discussing a child's progress. This would give parents a truer picture of their child's achievement and areas for improvement.

Participants between age 18 to 50, the age range of the whole sample, expressed they relied on teachers and the internet more than on T.V. for Pre-k math information. The findings suggest Head Start should explore using the Internet and other online technologies, like emails and teleconferences to help connect and engage parents with Pre-k math activities. Specifically, the agency could utilize its established website to create links to online programs promoting Pre-k math activities and to possibly consider an online chat option that allows parents to ask questions about Pre-k math resources. Local agencies could then inform parents of the resources during parent teacher meetings, and include in the newsletters and calendars.

The consensus among participants is teachers failed to share information about external resources suggest teachers may lack the knowledge about Pre-k math resources outside the Head Start agency. This implies Head Start as an agency should provide professional development for teachers and administrators to improve teacher knowledge about the available resources, and to train teachers how to link parents to access points for these resources. Head Start should explore contracting with a trainer or agency that could provide evidence-based training, and if the training does not exist, contract with an individual or agency to develop the training. The implication for children and parents if teachers and administrators do not receive the professional development is an uncertain future for the successful inclusion of children in the IKA.

Regardless of demographic distinctions, participants expressed they rely on the use of counting out loud as a tool to integrate math learning into their children's daily

lives. This implies participants' knowledge-base about how to engage their children in learning math is limited. Teachers and administrators should expose parents to a broader set of educational tools, like integrating math language into everyday life, and using board games as suggested by findings in the literature. Benigno and Ellis (2008) for example, suggested math skills improve with the use of activities like integrating math language in everyday life in the home. Siegler and Ramani (2008) and Welsch (2010) suggested playing board games with children teaches them to engage in higher cognitive functioning skills, like identifying what number comes before or after.

The current study filled a gap in the literature offering little about the knowledge Head Start parents had regarding resources to improve their children's academic performance. The study provided a platform for participants to express their knowledge, thoughts, feelings, and beliefs about Pre-k math resources, access, use, and integration of resources. The study revealed Head Start parents have knowledge problems about Pre-k math resources regardless of demographic distinctions. Head Start and political advocates for the advancement of Head Start should explore practical ways to improve knowledge about available resources. Uncovering what parents know can be achieved through a simple online survey. The survey could be created by the Office of Head Start, for example, to assess the knowledge parents have about Internet-based, T.V. and parent support resources that promote Pre-k math development.

The survey tool could be developed through a website like Survey Monkey. The Office of Head Start could notify all local Head Start agencies to encourage their parents to take part in the survey. Local agencies could then

provide the space and computer access for parents who do not have computer access.

The survey should assess parent knowledge about PIRCS, HIPPY, and the U.S. Department of Education online website. These resources, among other things, provide valuable information and tools to support parent knowledge about Pre-k math skill development, and help achieve one of Head Start's primary goals to ensure children enter Kindergarten on an equal footing with same age peers (USDHH, 2011). A reading assessment should also be administered to assess the reading ability of parents to ensure reading materials are comprehendible.

Recommendations for Educational and Political Leaders

The goal of the study was to fill a void in the literature and provide a voice to the parents of a disadvantaged population for consideration by leadership. Head Start parents expressed their thoughts and feelings related to the knowledge they have about Pre-k math resources. Giving a voice to the parents of the Head Start program helped clarify what parents know and do not know about available resources. The views participants expressed clearly revealed while parents have general knowledge about resources, the less educated and lower-wage earners within the study lacked specific knowledge.

Across demographic classifications, Head Start parents lacked sufficient knowledge about the skills their children need for successful math skill development based on the Head Start Content Standards and Early Learning Framework (2007). One of the goals was to help federal, state, and local

governments, and communities understand if the funds designed to improve parental knowledge of resources is in fact reaching the intended audience. The study revealed participants lacked knowledge of many of the online, T.V. and community based resources like PIRCs, HIPPY, and PAT, therefore exposing a gap between the available resources and intended users.

Commission locally based studies. Based on findings Head Start leaders and political advocates of Head Start should focus efforts toward commissioning more locally-based studies that assess parent knowledge issues among Head Start agencies. The studies should assess parent knowledge about Pre-k math skill development. Studies should not only examine what parents know, but how they acquire their knowledge about Pre-k math.

Assess parent and teacher knowledge through online survey. Head Start leaders can further their understanding of how parents acquire their information about Pre-k math through an online survey, using Survey Monkey as suggested. Having this knowledge can help leaders maximize the channels of information parents deem most plausible and credible. Head Start leaders should examine what teachers and administrators know about the resources and how teachers already share information regarding math resources. Allowing the survey to be taken online would ensure that teachers remain anonymous and would allow the agency to receive nationwide feedback from all agencies. Leaders should also explore how teachers apply the math curriculum across classes to ensure alignment with the Head Start Content Standards and Early Learning Framework (2007).

Reassess funding targets. Because of budget cuts since 2007 (Horney, Trisi, & Arloc, 2011), the Head Start Agency should reassess funding targets to ensure funding reaches teachers and parents to improve knowledge about Pre-k math resources as Pre-k math is believed to be the foundation for future academic success (Duncan, 2011; Duncan et al., 2007; Romano, et al., 2010). To ensure the academic success of Head Start children by connecting parents and teachers to resources that develop children's foundational math skills, is to ensure the overall competitiveness and success of the United States in the IKA and global economy. Students who enter school academically prepared will eventually become citizens who contribute to the nation's economy and help elevate the competitiveness of the country within the global economy.

Examine how parents are connected to external resources. Within the FET framework, leaders should examine exactly how the Head Start agency connects parents to local parent-to-parent resources, and other community based programs that can improve parent knowledge about Pre-k math resources. Leaders should approach policy issues through the lens of meeting the needs of a diverse group. Head Start parents, contrary to research, are a heterogeneous not homogenous group with diverse educational, employment, and economic backgrounds. They are aware of the impacts of Pre-k math skills on their children's academic and career success and seek opportunities to learn about and use available resources to benefit their children.

Recommendations for Future Research

This qualitative study contained a sample of 15 participants of which 100% were African American and 87% were single and female. Fifty-three percent of the participants had an 11^{th} to 12^{th} grade education and 47% had some college exposure or

held a degree. The data was collected from a single site geographically situated in an urban location. Generalizability of findings, based on the demographics of the participants and the geographic boundaries, are thus limited to Head Start parents with similar demographics and in similarly situated urban-based centers. Recommendations for future research include: expanding the sample size, exploring the same research questions across different geographic locations like rural-based Head Starts, and conducting quantitative analysis to assess causal relationships between variables that emerged in the current study.

Demographic distinctions emerged in the current study between participants with some college education or degree and those without, and between those with a lower wage (CNA, store clerk) and higher wage (firefighter, teacher, trucker). A comparative quantitative study could explore causal relationships between education level and math outcomes of Head Start students. Distinctions between higher wage and lower wage earners emerged as well, which again would warrant further research to explore causal relationships between occupational status and math achievement of Head Start students.

The sample was disproportionately female, with 13 females and two males. However, the responses obtained by males regarding the sources and use of Pre-k math information were starkly different. None of the males, for example, used T.V. as an educational resource compared to 85% of the females who did. Recommendations for future research would include a quantitative comparative study with a more representative sample of males and females in the Head Start program to assess the relationship between the ways in which males and females obtain Pre-k math information.

Considering only 27% of participants in the study expressed the use of federally funded programs like Sesame Street and Super Why, the Office of Head Start could conduct an online survey to reach as many Head Start parents to determine what T.V. programs they endorse and to what extent they agree the programs teach their children math concepts needed for successful academic outcomes. Because more participants expressed using non-federally funded programs like Team Oomie Zoomie, researchers should explore through a comparative quantitative analysis how parents rate non-federally funded programs compared to federally funded programs that teach Pre-k math. Taking into consideration the lack of knowledge about parent support programs that support Pre-k math development, exploration of what teachers and parents know about these programs is worthy of further research. The Head Start agency could once again initiate an online survey through Survey Monkey to assess parent and teacher knowledge about the types of educational T.V. programs that promote Pre-k math development.

Generalizability

The limitations for the current study were found primarily in the qualitative design of the study. Generalizability of results were minimized due to the small sample size of 15 participants and the single-setting and geographic location. Generalization of the study to all Head Start programs is not plausible. Purposeful sampling procedures used to select participants also limit the generalizability of the results of the study because the sample was not representative of all parents of Head Start programs across the country, with 100% being African-American, 87% being female, and 47% being college educated.

Researcher's Reflections

When I began this research I started on a journey to understand why Head Start children achieved math scores lower than their same age peers. The question was important to answer because early math skills are believed to be foundational to overall academic success (Duncan, 2011; Duncan et al., 2007; Romano et al., 2010). My research revealed the effects of poverty among low income families including those in Head Start, negatively impact the academic achievement of low-income children (Akers, 1989). Among a long list of poverty impacting issues was knowledge problems, where low-income families typically fail to benefit from services and resources because they simply are not aware or do not know how to access the resources.

Seminal studies, like North Carolina's Abecedarian Project, the Chicago Child Parent Centers, and the Perry Preschool Project, showed when low-income parents learn about and are taught how to implement educational programs for their children, their children's academic achievement including in math, improves notably. Improvements were sustained throughout adulthood. I wondered if a possible explanation for Head Start children not performing as well in math as their more affluent peers was because parents lacked knowledge of the resources and how to use them to improve their children's outcomes.

I chose to do a qualitative phenomenological study because the format was conducive to participants sharing their thoughts and feelings about their experiences through face-to-face semi-structured interviews. The participants in the study were willing to share their thoughts, were articulate, and expressed a high level of motivation to help their children academically. I was surprised to see this given literature that often

framed Head Start parents as having low-educational attainment with an average 10th grade education. Eight of the 15 (53%) participant in the study had an 11th to 12th grade education. The balance of the participants either had some college experience or held a degree, with two holding a Bachelor's and one a Master's degree.

I attempted to bracket my assumptions before starting the study and prior to each interview. Some bracketing included not projecting what I had read about Head Start parents in the literature onto my participants. One assumption was participants would be unmotivated and not very interested in doing the study. I found myself looking for non-verbal cues from the participants that might have suggested they really did not want to participate, or that they wanted the interview to be over as quickly as possible.

Participants willingly agreed to participate and expressed interest in why I was doing the study. During the interviews, once participants understood the process, they became relaxed and engaged. Some technical difficulties emerged at times with the taped audio recordings, where the recorder did not start at the onset of the interview, in which case the interview had to be restarted. Participants remained patient, engaged, and reflective in their responses.

I was impressed by the level of concern and tenacity participants displayed about getting and using as much information as they could to improve not just their children's math skills, but their overall academic performance. I witnessed participants who understood the importance and future impact of their children's math education in a world that increasingly requires a strong math background. One participant, who was a firefighter, wanted to share as much as possible about the Head Start program, his daughter's experience, and his personal experience with his child's teacher. He wanted

to express, for example, the program works to ensure children have opportunities to learn math by using board-games and paper clocks, and talking with parents about their child's progress. He expressed he felt his daughter was learning and that the school allowed him to volunteer.

I found myself being surprised by participants who regularly volunteered at the school, like the firefighter who was one among several participants who volunteered in their children's classes. Participants said through volunteering they obtain knowledge about their children's math activities. I was surprised and pleased to find father's volunteering.

One of the most surprising findings was learning how involved participants said they are in their children's daily learning. Regardless of participants' beliefs about whether or not teachers provided them with resources or taught their children, participants found ways to create activities that would help their children learn math concepts. I was surprised given findings in the literature by some researchers who framed Head Start and other low-income populations as lazy or deficient (Lips & Mulhausen, 2010) and not worthy of investment. I found participants to display more of what Cheadle (2008) called concerted cultivation, meaning they were willing to use the resources available to them like library or local museum.

Despite the motivation of participants to use the knowledge they had to assist their children in succeeding in math, I was discouraged to learn their knowledge was insufficient compared to the Pre-k math standards established by the Head Start Content Standards and Early Learning Framework (2007). I was surprised to find none of the participants knew about outside resources and could not confirm their teachers made

them aware of outside programs, which suggested to me teachers may be unaware of additional programs that offer participants Pre-k math support.

To realize a notable difference in these children's lives, Head Start leaders must take seriously the pertinent information gained from studies like this, to capitalize on parents' motivation, and to equip parents with specific knowledge to improve their children's math and overall academic outcomes. Academic improvement among Head Start children can only lead to positive outcomes, including improved chances for inclusion in the STEM pipeline, better earning potential, and productive contributions to society. The question is do Head Start leaders, political advocates, and the Federal Government have the political will to provide the financial resources needed to create the information and skill development trainings for parents, teachers and administrators?

Summary

Important to the success of low-income children in the IKA is adequate preparation in Pre-k math skills, shown to be the foundation for future academic success (Duncan, 2011; Duncan et al., 2007; Romano et al., 2010). Low-income parents face knowledge issues regarding the acquisition of resources to improve academic outcomes for their children (Farris et al., 2012). The results of the study suggested Head Start parents not only possess the motivation, drive, and desire toward positive academic achievement, but exercise a great deal of personal effort to obtain knowledge about Pre-k math resources (Cheadle, 2008).

The findings revealed participants identified primary resources as teachers, the Internet, and educational television. The findings also showed the sources they identified did not provide them with the specific knowledge related to the core skills outlined in the

Head Start Content and Early Learning Standards (USDHHS, 2007). Participants through their personal efforts, like inquiring of teachers, exploring websites, and creating home-based math games, applied their knowledge to everyday interactions with their children. Based on parent descriptions of their children's math skills, however, compared against the Content and Early Learning Standards, their children lacked a large portion of the skills needed for successful kindergarten entrance.

Participants expressed the importance of developing their children's Pre-k math skills for future academic and career success, however, knowledge about the resources, external to Head Start, was lacking. Participants expressed they were not informed about external resources but expressed a sense of support within the Head Start agency, suggesting teachers may lack knowledge of the external resources. Participants expressed a strong reliance on teachers to provide them with necessary information, although they appeared to trust themselves more to obtain the most relevant information (Knight, 2005).

The findings of the study showed a need for Head Start parents to have access to a broader base of information beyond the Head Start program to improve their knowledge of Pre-k math resources. Parents' motivation and willingness to use resources may serve to help their children effectively compete. Parent knowledge must be expanded to supplement the personal and internal resources of the Head Start agency to include programs, like PIRCS, HIPPY, and the U.S. Department of Education website, that support the acquisition of Pre-k math knowledge.

With proper exposure to resources, and adequate access, parents within the Head Start program and other low-income parents can make a significant difference in the

academic preparation and success of their children. Leaders who capitalize on the intrinsic motivation of parents who already seek out resources, can not only benefit the academic outcome of the child, but contribute to the child's career success, and ultimately to the broader national economic interest. Investments in Pre-k math support for low-income parents serve the overall best interest of the country in producing citizens equipped to adequately function in the IKA.

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Appendix A: Trend Data for Math Scores among Head Start Students

Appendix A: Trend Data for Low Math Achievement among Head Start Students

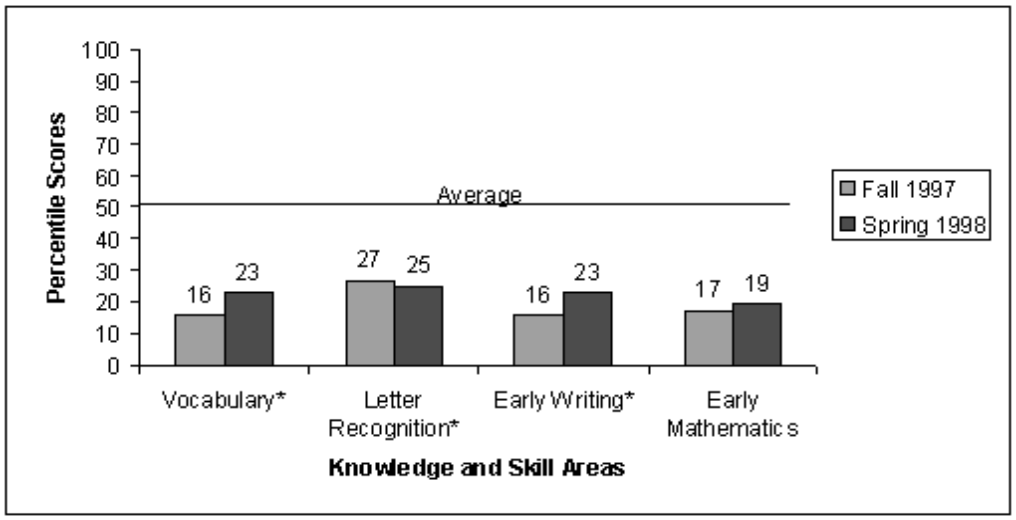


Figure 6. Head Start trend data. This figure illustrates the number of children who entered Head Start in 1997 who performed far below average upon entering and leaving Head Start (USDHHS, 2003).

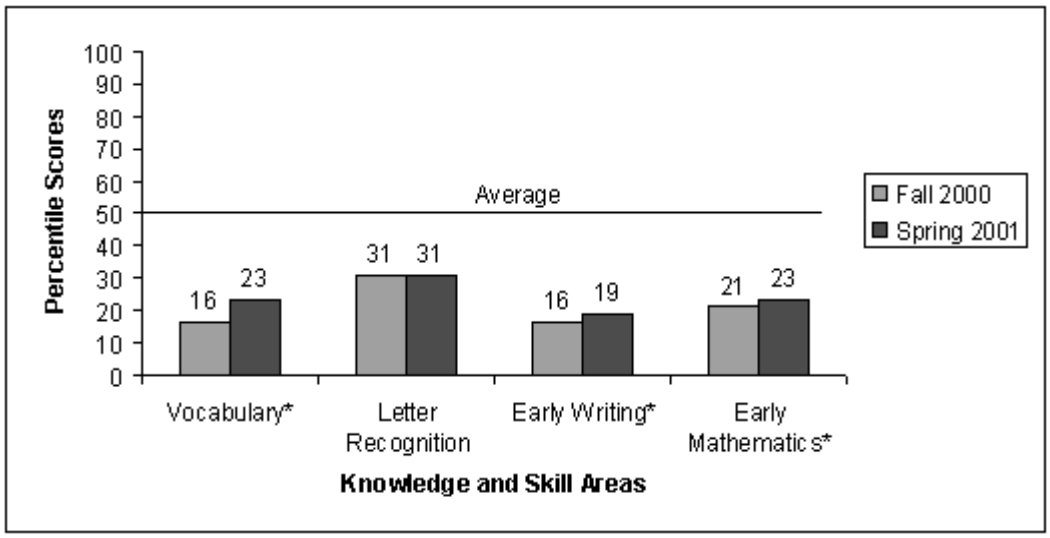


Figure 7. Head Start trend data. This figure illustrates children who entered Head Start in 2000 who still performed far below average both upon entering and leaving Head Start (USDHHS, 2003).

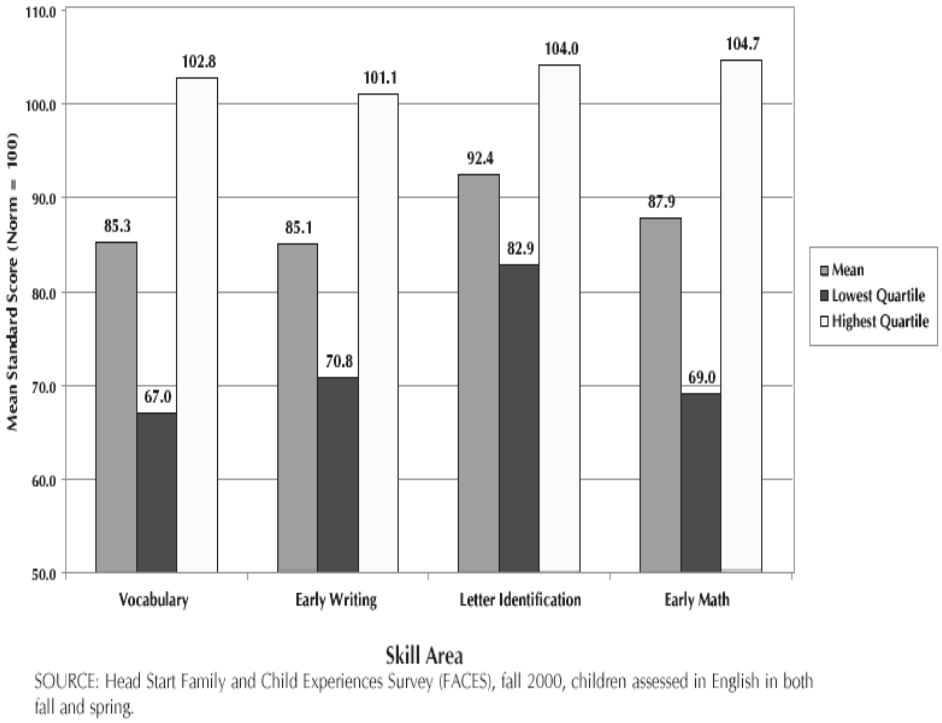


Figure 8. Head Start academic achievement. This figure illustrates Head Start low, median, and top quartile academic achievement scores including early math skills.

Appendix B: Parent Family and Community Engagement Model

Appendix B: Parent Family and Community Engagement Model

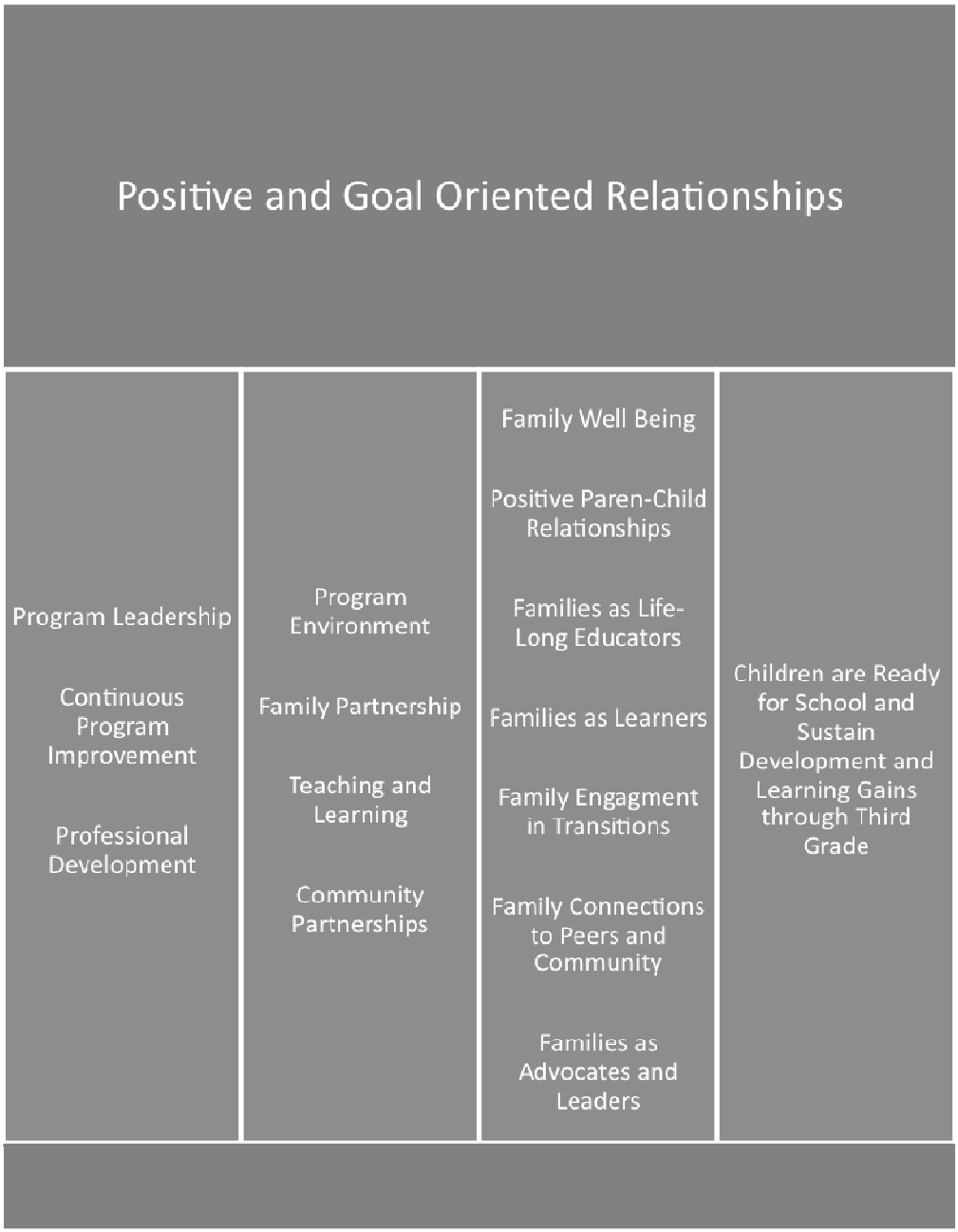


Figure 9. Parent, Family, and Community Engagement Model. This figure illustrates the goals of quality relationships Head Start works toward between community and families

Source: Adapted from the United States Department of Health and Human Services (2011).

Appendix C: Math Readiness Skills

Appendix C: Math Readiness Skills

Mathematics Knowledge & Skills refers to the conceptual understanding of numbers, their relationships, combinations, and operations. Mathematics also includes shapes and their structure; reasoning; measurement; classification; and patterns. Because math is also about generalizations and abstractions, math skills during the early years from birth to five help children to connect ideas, develop logical and abstract thinking, and to question, analyze, and understand the world around them. Math knowledge, interest, and skills are basic to children's success in school and later life. Early math skills are highly predictive of later academic achievement in multiple subject areas. In the domain of Mathematics Knowledge & Skills, programs need to ensure that children who are dual language learners can demonstrate their abilities, skills, and knowledge in any language, including their home language. The domain elements for mathematics knowledge & Skills for 3 to 5 year-olds are:

Number Concepts & Quantities

The understanding that numbers represent quantities and have ordinal properties (number words represent a rank order, particular size, or position in a list).

- Recognizes numbers and quantities in the everyday environment.
- Recites numbers in the correct order and understands that numbers come "before" or "after" one another.
- Associates quantities and the names of numbers with written numerals.
- Uses one-to-one counting and subitizing (identifying the number of objects without counting) to determine quantity.

- Uses the number name of the last object counted to represent the number of objects in the set.

Number Relationships and operations

The use of numbers to describe relationships and solve problems.

- Uses a range of strategies, such as counting, subitizing, or matching, to compare quantity in two sets of objects and describes the comparison with terms, such as more, less, greater than, fewer, or equal to.
- Recognizes that numbers (or sets of objects) can be combined or separated to ma
- Uses a range of strategies, such as counting, subitizing, or matching, to compare quantity in two sets of objects and describes the comparison with terms, such as more, less, greater than, fewer, or equal to.
- Recognizes that numbers (or sets of objects) can be combined or separated to make another number through the grouping of objects.
- Identifies the new number created when numbers are combined or separated.

Geometry and Spatial Sense

The understanding of shapes, their properties, and how objects are related to one another.

- Recognizes and names common shapes, their parts, and attributes.
- Combines and separates shapes to make other shapes.
- Compares objects in size and shape.
- Understands directionality, order, and position of objects, such as up, down, in front, behind.

Patterns

The recognition of patterns, sequencing, and critical thinking skills necessary to predict and classify objects in a pattern.

- Sorts, classifies, and serializes (puts in a pattern) objects using attributes, such as color, shape, or size.
- Recognizes, duplicates, and extends simple patterns.
- Creates patterns through the repetition of a unit.

Measurement and Comparison

The understanding of attributes and relative properties of objects as related to size, capacity, and area.

- Compares objects using attributes of length, weight and size (bigger, longer, taller, heavier).
- Orders objects by size or length.
- Uses nonstandard and standard techniques and tools to measure and compare.

Source: The Head Start Content Standards and Early Learning Framework (2007).

Appendix D: Head Start Demographics

Appendix D: Head Start Demographics

Table 15

Head Start Demographics Fiscal Year 2009

FY-2009 Program Statistics	
ENROLLMENT	904,153
Ages	
Number of 5 year olds and older	3%
Number of 4 year olds	51%
Number of 3 year olds	36%
Number under 3 years of age	10%
Racial/Ethnic Composition	
American Indian/Alaska Native	4.0%
Black/African American	30.0%
White	39.9%
Asian	1.7%
Hawaiian/Pacific Islander	0.6%
Bi-Racial/Multi-Racial	7.8%
Unspecified/Other	16.7%
Hispanic/Latino	35.9%

Source: Early Childhood Learning and Knowledge Center, Office of Head Start (2010).

Appendix E: Head Start Logic and Reasoning Domain

Appendix E: Head Start Logic and Reasoning Domain

Logic & Reasoning refers to the ability to think through problems and apply strategies for solving them. Logic and reasoning skills are an essential part of child development and early learning and a foundation for competence and success in school and other environments. Children's ability to think, reason, and use information allows them to acquire knowledge, understand the world around them, and make appropriate decisions. In the domain of Logic & Reasoning, programs need to ensure that children who are dual language learners can demonstrate their abilities, skills, and knowledge in any language, including their home language. The domain elements for logic & reasoning for 3 to 5 year olds are:

The ability to recognize, understand, and analyze a problem and draw on knowledge or experience to seek solutions to a problem.

Seeks multiple solutions to a question, task, or problem.

Recognizes cause and effect relationships.

Classifies, compares, and contrast

Source: Head Start Content Standards and Early Learning Framework (2007).

Appendix F: Family Engagement in Transitions

Appendix F: Family Engagement in Transitions

Parents' perspectives on Pre-k math resources opportunities in the Head Start program should reflect the following:

- Learning about their role in creating continuity for children as they transition Pre-k math into kindergarten math and related activities
- Anticipating and recognizing their child's adaptive needs for different levels of mathematics as changes and transitions occur in early childhood education and school settings.
- Learning about how everyday interactions with preschool children are opportunities to promote and develop math skills to prepare for school readiness as outlined in the Head Start Child Development and Early Learning Framework.
- Learning about their rights under federal and state laws, such as their rights under the Individuals with Disabilities Education Act (IDEA).
- Building upon their strengths as program/school advocates through participation in program supported transition activities.
- Accessing information about existing local parent-to-parent organizations, family peer networks, and parent-initiated school-community efforts around Pre-k math resources related programs in order to continue engagement in new settings.

Source: Adapted from the United States Department of Health and Human Services (2010).

Appendix G: Permission to Conduct Study

Appendix G: Permission to Conduct Study

UNIVERSITY OF PHOENIX

Permission to Use Premises, Name, and/or Subjects(Facility, Organization, University, Institution, or Association)Name of Facility, Organization, University, Institution, or Association Baltimore City, Maryland Head Start

I hereby authorize Juanita Brigman, student of University of Phoenix, to use the premises (facility identified below) to conduct a study entitled Exploring Head Start Parents' Awareness and Use of Pre-k Math Resources to Improve Academic Outcomes.

I hereby authorize Juanita Brigman, student of University of Phoenix, to recruit subjects for participation in a study entitled Exploring Head Start Parents' Awareness and Use of Pre-k Math Resources to Improve Academic Outcomes.

I hereby authorize Juanita Brigman, student of University of Phoenix, to use the name of the facility, organization, university, institution, or association identified above when publishing results from the study entitled Exploring Head Start Parents' Awareness and Use of Pre-k Math Resources to Improve Academic Outcomes.

Signature Date: August 1, 2011

Shannon Burroughs-Campbell, Chief Operating Officer

Child Development Coordinator

Baltimore City Head Start

2700 North Charles Street

Baltimore, Maryland 21218

Appendix H: Recruitment Ad

Appendix H. Recruitment Ad

Researcher is looking for parents 18 years and up with a child who began Head Start during the2011-2012 school year. Participants must be able to share thoughts and feelings freely and in detail. Participants must be able to commit to at least three 45 minute sessions on three separate occasions to allow the participant and researcher adequate time to collect and verify information. Two sessions will be used to interview and the third session will be used to allow the participant to verify their responses. Interviews will take place in a mutually convenient location but not on the grounds of Head Start. Participants may help contribute important information to educational and political leaders that may help improve services to children. Participants are able to withdraw from the study at any time before, during, or after the study.

Appendix I: Informed Consent

Appendix I: Informed Consent

Informed Consent: Participants 18 years of age and older

This form may be used as a general guide to fulfill the requirements of informed consent. Items in bold typeface or underlined must be written to describe specific elements of the research study. **[Please remove this paragraph when finalizing this form for use.]**

Dear ,

My name is Juanita Brigman and I am a student at the University of Phoenix working on a Doctorate of Education in Educational Leadership degree. I am doing a research study entitled Exploring Head Start Parents' Awareness and Use of Pre-k Math Resources for Improved Academic Outcomes The purpose of the research study is to explore what Head Start parents know about the available Pre-k math resources designed to improve their children's academic outcomes and to explore how they integrate Pre-k math resources into their children's daily lives..

Your participation will involve up to two face-to-face interviews that will last no longer than 45 minutes each. During the interviews you will be expected to share your thoughts honestly and clearly. The interviews will be audio-taped. The interviews will take place at a library most convenient for you and held in a room that I will reserve in advance. You will be one of 15 parents participating in the study. You can decide to be a part of this study or not. Once you start, you can withdraw from the study at any time without any penalty or loss of benefits. The results of the research study may be published but your identity will remain confidential and your name will not be made known to any outside party.

In this research, there are no forseeable risks to you except none.

Although there may be no direct benefit to you, a possible benefit from your being part of this study is helping Head Start leaders, politicians, and other educational leaders become aware of what you know or do not know about the Pre-k math resources that have been created to help you help your child be successful in school. What you share may help leaders understand how to help you and your child get the resources you need to improve your child's Pre-k math skills.

If you have any questions about the research study, please call me at 443-231-8426 and email me at j_brigman2005. For questions about your rights as a study participant, or any concerns or complaints, please contact the University of Phoenix Institutional Review Board via email at IRB@phoenix.edu.

As a participant in this study, you should understand the following:

You may decide not to be part of this study or you may want to withdraw from the study at any time. If you want to withdraw, you can do so without any problems.

Your identity will be kept confidential.

Juanita Brigman, the researcher, has fully explained the nature of the research study and has answered all of your questions and concerns.

If interviews are done, they may be recorded. If they are recorded, you must give permission for the researcher, Juanita Brigman, to record the interviews. You understand that the information from the recorded interviews may be transcribed. The researcher will develop a way to code the data to assure that your name is protected.

Data will be kept in a secure and locked area. The data will be kept for three years, and then destroyed.

The results of this study may be published.

"By signing this form, you agree that you understand the nature of the study, the possible risks to you as a participant, and how your identity will be kept confidential. When you sign this form, this means that you are 18 years old or older and that you give your permission to volunteer as a participant in the study that is described here."

(☐) I accept the above terms. (☐) I do not accept the above terms.

(CHECK ONE)

Signature of the interviewee _____ Date

_____

Signature of the researcher _____ Date

_____

Appendix J: Confidentiality Agreement

Appendix J: Confidentiality Agreement

EXPLORING HEAD START PARENTS' AWARENESS AND USE OF PRE-K MATH RESOURCES FOR IMPROVED ACADEMIC OUTCOMES

Juanita Brigman

CONFIDENTIALITY STATEMENT

As a researcher working on the above research study at the University of Phoenix, I understand that I must maintain the confidentiality of all information concerning all research participants as required by law. Only the University of Phoenix Institutional Review Board may have access to this information. "Confidential Information" of participants includes but is not limited to: names, characteristics, or other identifying information, questionnaire scores, ratings, incidental comments, other information accrued either directly or indirectly through contact with any participant, and/or any other information that by its nature would be considered confidential. In order to maintain the confidentiality of the information, I hereby agree to refrain from discussing or disclosing any Confidential Information regarding research participants, to any individual who is not part of the above research study or in need of the information for the expressed purposes on the research program. This includes having a conversation regarding the research project or its participants in a place where such a discussion might

be overheard; or discussing any Confidential Information in a way that would allow an unauthorized person to associate (either correctly or incorrectly) an identity with such information. I further agree to store research records whether paper, electronic or otherwise in a secure locked location under my direct control or with appropriate safe guards. I hereby further agree that if I have to use the services of a third party to assist in the research study, who will potentially have access to any Confidential Information of participants, that I will enter into an agreement with said third party prior to using any of the services, which shall provide at a minimum the confidential obligations set forth herein. I agree that I will immediately report any known or suspected breach of this confidentiality statement regarding the above research project to the University of Phoenix, Institutional Review Board.

/s/ *Juanita Brigman*	Juanita Brigman	05/08/2012
Signature of Researcher	Printed Name	Date
/s/ *Betty J. Jones*	Betty J. Jones	05/08/2012
Signature of Witness	Printed Name	Date

Appendix K: Process Data Destruction Form

Appendix K: Process Data Destruction Form

All personal data of Head Start parents recorded electronically, including audio-taped interviews, transcripts, and voice to text data associated with research conducted by researcher, Juanita Brigman, will be destroyed after three years. The BCWipe data eraser (Jetico, n.d.) will be used to permanently delete selected files.

Using HIPPA (2002) guidelines, hard copies of personal data may include:

Personal and Reporting Information

All [HSP] information which contains identifying information, e.g. appointment dates, research records

Documents Made Confidential by Agreement, Organizational Policy, or Practice

Documents containing proprietary information

Documents Where Careless Disposal Could Jeopardize a Participant's Privacy

Social security numbers with names, or addresses of the individual (or family members) who is the subject of the research

Participant's personal financial data, including Medicare and Medicaid identifiers

According to HIPPA regulations, documents will be destroyed using one of the following two options:

- Pulping (recycling)
- Shredding *or*
- Combination of methods

You may decline to participate or withdraw from participation at any time without consequences. Your identity will be kept confidential.

Appendix L: Demographic Information Form

Appendix L: Demographic Information Form

Please complete the information below: If there are questions you prefer not to answer please leave blank. You may decline to participate or withdraw from participation at any time without consequences. Your identity will be kept confidential.

Participant Name: _____

Last First

Age:____ (optional) Gender: Male _____ Female _____ (optional)

Marital Status: Single _____

Married _____

Address:_____

Street

_____

City, State, Zip

Number of Children in Head Start _____

Age of child(ren) in Head Start_____

Expected Date of Child's Promotion to kindergarten_____

Please check which classes your child participates in:

Math ○

Art ○

Social Studies ○

Science ○

Reading ○

Dress Up ○

Writing ○

Appendix M: Interview Protocol

Appendix M: Interview Protocol

McNamara (2009) suggested an eight stage protocol to ensure clear focus as to how the interviews should be structured in order to produce optimal results from the proposed research study (McNamara, 2009). McNamara proposed:

(1) A setting with little distraction either on the Head Start grounds or a place convenient to the Head Start parent and the researcher will be chosen;

(2) The purpose of the interview will be explained and participants informed that at any time they may choose not to participate and their information will be held confidential;

(3) The terms of confidentiality will be discussed;

(4) The interviewer will explain the format of the interview

(5) The researcher will indicate how long the interview will take;

(6) Participants will be informed about how to reach the researcher at a later time

(7) Participants will be allowed to ask questions before the interview begins and reminded again they may choose to end the interview or decide to no longer participate in the study.

(8) The researcher will use audio-taped equipment to record the interview

Participants will be asked identical questions, but questions will be worded so participants may give open-ended responses. The interviewer will ask probing questions following participants' responses. The open-ended, in-depth interview requires participants to fully express their responses in detail to allow the researcher to extract

themes or codes from the interview transcripts. During the interview process, the researcher will do the following:

(a) occasionally verify the audio equipment is working;

(b) ask one question at a time;

(c) attempt to remain as neutral as possible by not showing strong emotional reactions to responses;

(d) encourage responses with occasional nods of the head, "uh huh"s, etc.;

(e) be mindful of non-verbal gestures that can be construed as surprise which can potentially influence participants' responses

(f) provide transition between major topics

(g) do not lose control of the interview (McNamara, 2009)

Appendix N: Data Collection Procedures

Appendix N: Data Collection Procedures

After confirming participants in the study, participants were notified to meet in a private room located in an adjacent building that housed the Kitchen and other classrooms. Prior to participants arriving, I structured the room such that the seat for the participant was located directly across from myself at a long rectangular table. Head sets for the Dragon Naturally Speaking software was placed conveniently where the participant could place them on their head. The Confidentiality, Process Data Destruction, and Consent forms were organized in the order of presentation. An audio recorder was used in addition to the Dragon Naturally Speaking software and was set to record prior participants arriving.

When participants arrived, each was greeted and welcomed to sit in the pre-assigned seat. To establish a comfort level between myself and the participant, I opened with thanking the participants for coming and engaged them in a brief light-hearted discussion about things like the weather or simply asking how they were doing that day. I took time to explain the purpose of the study. Each participant was given an opportunity to ask questions before proceeding to the forms. Participants were advised their information would be confidential and stored for three years after which their information would be destroyed.

Participants were presented with the Process Data Destruction form that explained the various methods of data destruction. Each participant was informed of the purpose of the study, the benefits and known risks, and potential impact on future research. Parents who consented to proceed with the study signed the Consent form. At the end of each form participants were advised of their right to withdraw at anytime from the study or

interview without penalty or repercussion. All forms were set aside and the interviews began.

Each participant was informed about the equipment on the table and how it would be used. Participants were instructed to place the head set of the Dragon Naturally Speaking software on their heads and to speak into the microphone that extended from the right side of the head set. Prior to each interview, I had each participant speak into the headset to ensure participants voices were being detected by the software. Upon confirming detection by both the Dragon software and the recorder, interviews proceeded.

Appendix O: Pilot Test Questionnaire Rating Matrix

Appendix O: Pilot Test Questionnaire Rating Matrix

Please rate the questions presented in the study according to the rating scale.

Table 16

Pilot Test Questionnaire Rating Matrix

	Poor Question is difficult to understand and should be rewritten	Fair Question is somewhat understandable, but parts may be hard to understand	Good Question is understandable and fairly easy to understand	Excellent Question is very easy to understand and should not be reworded	Not Sure
Q1					
Q2					
Q3					
Q4					
Q5					
Q6					
Q7					
Q8					

You may decline to participate or withdraw from participation at any time without consequences. Your identity will be kept confidential.

Appendix P: Interview Guide

Appendix P: Interview Guide

1. Please explain how you learn about math activities from the school to help improve your child's math skills for your child in school.
2. Describe how you learn about and use mathematics resources outside of the school environment?
3. Please provide the names of school, community, or T.V. programs/activities that teach your children about math.
4. Describe how your child learns about math in the home.
5. Describe how your child learns about math in the home.
6. How does your child use math in the home?
7. How does the school inform you about Pre-k math programs and activities?
8. How would you describe the way you use math materials provided by the school to teach your child math?
9. How would you describe your child's skill level in math, (Poor, Fair, Good, Excellent). Why?
10. What knowledge do you have about how your child's math knowledge will influence his or her ability to be hired in a high paying job as an adult?

Appendix Q: Pilot Questionnaire Respondent

Appendix Q: Pilot Questionnaire Respondent

One Head Start parent who did not participate in the final study rated the appropriateness of the interview questions to determine the ease of understanding each question. Based on feedback from the participant, I made adjustments to simplify the wording of the interview questions and to ensure responses would yield rich textual and structural descriptions. Using the sampling criteria for the study, the test participant was solicited from among the study population using a parent roster provided by the Head Start agency. The pilot interview participant signed the inform consent form (see Appendix I), was provided a copy of the Promise of Confidentiality form (see Appendix J) and received a copy of the processes of data destruction form (see Appendix K). The pilot participant rated the questions using the pilot study questionnaire form and the rating scale (see Table 4). Based on the feedback, six questions were rewritten for ease of understanding and one new question was added to replace a duplicate.

Appendix R: Pilot Interview Rating Results

Appendix R: Pilot Questionnaire Rating Results

Pilot Questionnaire Rating Results

Table 17

Pilot Questionnaire Rating Results

	Poor Question is difficult to understand and should be rewritten	Fair Question is somewhat understandable, but parts may be hard to understand	Good Question is understandable and fairly easy to understand	Excellent Question is very easy to understand and should not be reworded	Not Sure
Q1		X			
Q2		X			
Q3		X			
Q4				X	
Q5	X Duplicate				
Q6	X Almost identical to Q4				
Q7				X	
Q8			X		
Q9				X	
Q10	X				

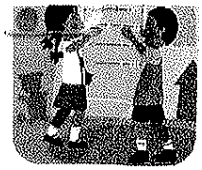
Appendix S: Revised Interview Guide

Appendix S: Revised Interview Guide

1. Please explain how you learn about math activities from the school to help improve your child's math skills.
2. Describe how you learn about and use mathematics resources outside of the school.
3. Please provide the names of school, community, or T.V. programs/activities that teach your children about math.
4. Describe how your child learns about math in the home.
5. Describe the ways you look for information to teach your child math at home.
6. How does your child use math in the home?
7. How does the school inform you about Pre-k math programs and activities?
8. How would you describe the way you use math materials provided by the school to teach your child math?
9. How would you describe your child's skill level in math, (Poor, Fair, Good, Excellent). Why?
10. What knowledge do you have about how your child's math knowledge will influence his or her ability to be hired in a high paying job as an adult?

Appendix T: Monthly Newsletters/Calendars

Appendix T: Monthly Newsletters/Calendars



OCTOBER 2012
CONSCIOUS MINDS

From the Director's Chair

JAMBO PARENTS!!! I would like to take this opportunity to say Thank You to the many parents who are showing a dedicated interest in participating in classroom committee meeting and working in the classrooms. It is a sign of excellent parent involvement. While I know and understand that many people must work and are unable to volunteer in the class, there are other ways you can become involved in your child's classroom. **Each parent should know that we are asking you to participate in the reading logs. You will be credited an hour a day for reading books to your child, engaging them in this, and having them read back to you.** If you do not have books to read to your child, please let us know immediately. There are massive numbers of books accessible to you for your child in the center!!!. As you will recall, I advised you in the beginning of the year that we have to have a 20% match of the federal money given to us to run the program. **St. Bernardine's must generate a total of $336,386.00 in order to continue to remain open!!!**

PARENTS PLEASE READ, DIGEST THESE NEXT SENTENCES, AND HEAR MY HEART. THE CENTER OFFICIALLY CLOSES AT 4:00PM. *YOU MUST PICK YOUR CHILD UP ON TIME;* AND YOU MUST PROVIDE US WITH ACCURATE EMERGENCY NUMBERS IN CASE YOU ARE RUNNING LATE. IF YOU ARE LATE 5 TIMES WITHIN A MONTH YOU WILL RECEIVE A WRITTEN WARNING. THE NEXT TIME LATENESS OCCURS; YOUR CHILD'S FOLDER WILL BE REVIEWED FOR CONTINUED ENROLLMENT. HOWEVER, IF YOU HAVE NOT PICKED YOUR CHILD UP WITHIN ½ HOUR OF YOUR DISMISSAL TIME, NO ONE HAS COME TO SECURE THE CHILD, AND WE HAVE NOT HEARD FROM YOU, WE WILL HAVE NO RECOURSE BUT TO CONTACT THE POLICE. MY STAFF HAVE FAMILIES THAT THEY NEED TO GET HOME TO AS WELL AND IT IS NOT FAIR TO CONTINUE ASKING THEM TO STAY WITH THE SAME CHILDREN OVER AND OVER.

We are conducting our self assessment during the week of December 3-7, 2012. St. Bernardine's like every other center has to assess the services being offered and performed on a daily basis. **If you would like to volunteer to be a part of this, please see either me or Mrs. Linton.** There will be training on the assessment.

The holiday season is approaching. We are asking each family to donate canned goods and or staples. We will use the donations to fulfill Thanksgiving Baskets. Donations may be dropped off in the classrooms.

Thank you all.

MATERIALISM

American society is obsessed with wealth. We all say that "money doesn't buy happiness" but how many of us spend more time in shopping malls than libraries? How many of us give things to our loved ones instead of the attention and caring they truly need? How many of us have been willing to sell our souls for material goods?

We get preoccupied with attaining wealth and amassing more and more things. The more stuff we have, the more stuff we think we need. Let's be clear about the difference between wants and needs. We need sufficient shelter, transportation, and adequate clothing. But most of us do not need a three story, five bedroom, three car garage house. We do not need luxury cars and designer wardrobes. These are things we want.

It is not wrong to want fine things, but we should do so with knowledge that these things will not bring us happiness. Only love of others, God, and self engaging in meaningful activities brings deep personal satisfaction that we want and need.

I turn to healthy relationships and communing with the Creator, not things, for love and happiness.

Remember God at all times throughout the year.

EDUCATION CHIT-CHAT

Greetings Parents/Guardians:

HOW MANY PRESCHOOLERS LEARN THE MANY ASPECTS OF MATH

Many preschoolers, even without guidance from adults, are naturally interested in math as it exists in the world around them. They learn math best by engaging in dynamic, hands-on games and projects. Preschoolers love to ask questions and play games that involve the many aspects of math. The table below lists the key aspects of preschool math, along with simple activities you can use to help your child learn them.

Math Aspect	Games and Activities
Number Sense	Count food items at snack time (e.g. 5 crackers and 20 raisins Use a calendar to count down the days to a birthday or special holiday. Help your child see the connection between a numeral like "5", the word "five", and five days on the calendar. Play simple board games where your child moves a game piece from one position to the next.
Geometry	Have your child name the shapes of cookie cutters or blocks Arrange cookie cutters in patterns on a cookie sheet or placement. A simple pattern might be star-circle-star-circle
Measurement	Let your child help you measure ingredients for a simple recipe-preferably a favorite. Measure your child's height every month or so, showing how you use a yardstick or tape measure. Mark his or her height on a "growth char" or a mark on a door frame. Do the same with any siblings. Help your child compare his or her own height to previous months, and also to his or her siblings height.
Math Language	Talk through games and daily activities that involve math concepts. Have your child name numbers and shapes. Help him or her understand and express comparisons like more than/less than, bigger/smaller, and near/far
Spatial Relations	Play games where you direct your child to jump forward and back, to run from you or stay nearby. Use songs with corresponding movements to teach concepts in and out, up and down and round and round.

October 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2 *Canned Food Drive Begins* *Oct 2 thru Nov 16, 2012*	3 *Fire Safety Demonstration* *Free Smoke Detector Info*	4	5	6
7	8 *Breast Cancer Awareness Week*	9	10	11	12 *School-wide Walk-a-thon for Breast Cancer Awareness* *"Real Dad's Wear Pink"*	13
14	15 NUTRITION INFORMATION *Child Obesity Workshop 1:00pm*	16	17 *PICTURE DAY* *Classroom Committee Meeting 5:00-7:00pm*	18 *PICTURE DAY*	19 *PROFESSIONAL DAY SCHOOL CLOSED FOR CHILDREN*	20
21	22	23 *Health & Social Service Advisory Board Meeting Expo Planning 1:30pm*	24 *Parent Workshop 2:40pm*	25	26	27
28	29	30	31 *Harvest Day* *Breakfast for Dads 9:00-11:00am*			

FEBRUARY 2012
CONSCIOUS MINDS

JAMBO PARENTS!!!

From the Director's Chair

Can you believe it feels like spring? **Yet, it is still winter.** If you are anything like me, this Daylight Savings Time has thrown me for a loop!! I wanted to share with each of you that we found out this past Friday, that Head Start will have approximately another year to 18 months before re-designation takes over. **Officially, the Mayor and City Council of Baltimore lost the 30 Million dollar grant covering the entire city.** Subsequently we were told that the grant goes up for re-competition and anyone can compete; therefore they would have the decision to either keep St. Bernardine's going, or get rid of it.

We are in the midst of making the necessary corrections to the center that were identified in the Self Assessment. We had recommendations and a couple of non compliances. These are being corrected as we speak; but we had no deficiencies. There were several recommendations that we will be taking into accountability. Subsequently, since we did our own internal self assessment in December, we completed our corrective action plan and submitted it to the grantee. I would personally like to THANK EACH AND EVERY PARENT, GUARDIAN, OR REPRESENTATIVE that participated in the review. According to the monitors, we were given many accolades by those participants. In addition, our partners, our Delegate representatives (Barbara Smith & Dr.Barbara Faw), the staff, and the documentation were extremely well organized, presented, and maintained. I will keep you apprised of the continuing developments of the next level as we complete the process.

I would like to applaud and thank the many parents who came out for the classroom committee meeting held last month and look forward to a similar if not better turn out this month.

I am pleased to announce that we have a new nutritionist onboard; Ms Noni Robinson. As she begins to review children's folders, she may contact some of you with concerns. Please understand, she has our children and family's best interest at heart. Please join me in welcoming her.

Peace and Blessings,

EDUCATION CORNER

Dear Parents/Guardians:

Our children are embarked upon a new month, February. Our primary focus will be on math and science. This month's theme is Black History and Science Fair. The teachers will be introducing Black History through interactive arts and crafts projects, songs, poems, and dance. We will be focusing on activities that will enhance fine motor skills and large motor skills. Our children will be given a basic understanding of Black History, past and present. Our children will also learn about the contributions of African Americans.

President Barack Obama

Dr. Martin Luther King, Jr.

Beyonce Knowles

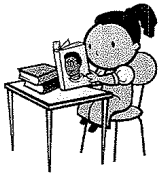
Angela Davis

CLASSROOM CHIT CHAT

Greetings Parents/Guardians,

We hope that you have had a great start to the New Year. We have many exciting things planned for the month of February. It's Black History Month!! Please feel free to step into your child's class and share a fun fact about your favorite African American hero. On February 14th, we will be having our "winter social." Please feel free to volunteer your time and decorations. Again, we would like to thank you for being your child's first teacher.

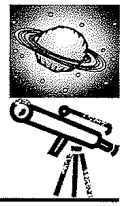
Submitted by:

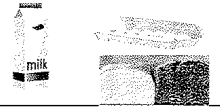


BLACK HISTORY MONTH

February 2012

SCIENCE & EXPLORATION



Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 	3	4
5	6	7 ***2:45pm—Policy Committee Meeting in Community Room***	8	9	10	11
12 	13 ***2:00-5:00pm Photos for Fathers & Families*** ***5:00pm—Classroom Committee Meeting & Parent Rally "Save Our Head Start" w/ Raffle Drawing in Harcum Hall***	14 **Happy Valentine's Day**  **Valentine Social (All Classes)**	15 ***11am-12:30pm Substitute Training*** ***Be Kind to Your Pet Day (Baltimore City Anti-Animal Abuse Commission*** 	16	17 ***9am—3pm Wireless for Hope Free Cell Phone Giveaway to Qualifying Families*** 	18
19	20 ***HOLIDAY CENTER CLOSED President's Day*** 	21	22 	23 ***WIC*** ***On site all day in FSC office*** 	24	25
26	27	28 ***10:00-11:30am Substitute Training***	29 ***2:40 pm—Mental Health Parent Workshop in Community Room***			

MARCH 2012
CONSCIOUS MINDS

JAMBO PARENTS!!! **From the Director's Chair**

Please remember to keep your children in lightweight winter clothing. Winter does not end until March 20th when Spring officially begins. I realize and know that it is hard to believe based on this weather pattern but this is something none of us control.

As each of you know, Head Starts throughout the city are going through some major changes. These changes may affect some of you individually but I will keep you posted on the changes.

Re-registration will begin in April. If your child was here last year and you want to secure your slot, please make sure you see your FSC. **THERE WILL BE NO SCHOOL FOR CHILDREN ON MARCH 30TH. STAFF WILL PARTICIPATE IN TRAINING AND CLEANING OF CLASSROOMS AND OFFICES. CHILDREN LEAVE ON MARCH 29TH AND RETURN TUESDAY, APRIL 10, 2012.**

We will also begin working on committees for: graduation, closing exercises, volunteer awards ceremony, fun day, etc. Please let your Teachers or Education Coordinators know which committee you would like to work on.

As always, it has been a pleasure serving each of you and your family. Please be safe during Spring Break and I look forward to seeing each of you on the 10th.

THOUGHT FOR THE DAY

Crisis/Exhaustion/Control

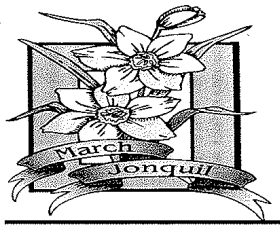
Living our lives like Chicken Little can be quite exhausting. Yet so many of us live from one crisis to another! We have become so accustomed to crisis and deadlines that we feel almost lost if we are not putting out some kind of fire. In fact, if we really were honest, there is something dramatic and exciting about handling a ***crisis.*** It makes us feel as if we have some modicum of control in our lives.

We have, however, on occasion wondered if all these crises are normal and if there is another way to live life that might be a little less exhausting. Even though we are exhilarated in handling these crises, they do leave us feeling drained. Could it be that these things don't just happen to us? That we have a hand in their creation?

As we begin to work on our recovery from issues, we see others around us who do not live from one crisis to another, and they seem to do just fine…they're even serene.

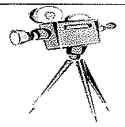
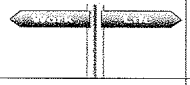
Crisis and the illusion of control are not unrelated. I hope you will allow yourselves to be open to noticing the relationship between the two in your life.

Peace and blessings,



March 2012

NATIONAL NUTRITION MONTH

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 ***Annual $2 Per Child Campaign (March 1st—16th)***	2	3
4	5 ***Re-Enrollment for Next Year Begins***	6 ***Policy Committee Meeting 2:45pm***	7 ***Nutrition Workshop 2:00—2:30pm***	8	9	10
11 ***Daylight Savings Time***	12	13 ***Picture Day Uniforms Only*** 	14 ***Nutrition Workshop 2:00—2:30pm***	15	16	17 ***St. Patricks Day*** 
18	19 ***Career Week*** ***Parents invited to come and share what they do with students*** ***(19th—23rd)*** 	20 ***First Day of Spring***  ***March Madness "Hot Shot Dads" Basketball Clinic*** 	21 ***Book Buggy (9:45am-2:00pm)*** ***Bring your library card or sign up for one*** ***Nutrition Workshop 2-2:30pm*** ***Classroom Committee Meeting—2:45pm***	22 ***WIC—On site*** ***College Admissions 101*** ***Morgan State Univ. Recruiter—On Site 2:00pm***	23	24
25	26 ***Book Buggy (10:00am—2:00pm)*** ***Final Week for Re-Enrollments***	27	28 ***Nutrition Workshop (2:00—2:30pm)*** ***Mental Health Workshop—2:40pm***	29	30 ***School Closed for Children Professional Day***	31 ***School Closed for Spring Break April 2-9, 2012 Staff and Children Return April 10th***

MAY 2012
CONSCIOUS MINDS

From the Director's Chair

JAMBO PARENTS!!! WE ARE CURRENTLY IN THE HOME STRETCH. MANY THANKS TO THE PARENTS WHO HAVE ALLOWED US TO DO THE JOB WE DO, AND FOR THE OTHERS WHO SUFFERED SEPARATION ANXIETY, I SAY TO YOU, "IT IS OKAY, YOUR BABY DID VERY WELL AND WE ALL SURVIVED (LOL)!" I WOULD ALSO LIKE TO THANK THE MANY, MANY PARENTS WHO VOLUNTEERED IN SO MANY DIFFERENT WAYS. THERE WERE WELL OVER 80 PARENTS AT THE POLICY COMMITTEE MEETING LAST MONTH. PLEASE STAY TUNED FOR MORE INFORMATION FROM THE POLICY COMMITTEE AND THE CENTER ON THE CENTER ACTIVITIES: (1) END OF THE YEAR SCHOOL TRIP, (2) FUN DAY, (3) DONUTS, (4) CLOSING EXERCISE PRACTICE, AND VOLUNTEER AWARDS CEREMONY. PLEASE BE ADVISED, THERE CAN BE NO BALLOONS IN THE CHURCH.

POLICY COMMITTEE, YOU ROCK!

I WOULD LIKE TO ALSO ADVISE YOU, IF YOU HAVE NOT REGISTERED YOUR CHILD FOR NEXT YEAR, PLEASE DO SO. ALSO SPEAK WITH YOUR FSC ABOUT REGISTRATION FOR ANY OTHER CHILDREN YOU HAVE.

THANK YOU FOR THE OPPORTUNITY TO SERVE YOU AND YOUR FAMILY. WE WISH YOU A BLESSED AND SAFE SUMMER. **PLEASE COME BACK FIRED UP FOR SCHOOL!!**

PEACE AND BLESSINGS,

THOUGHT FOR THE DAY

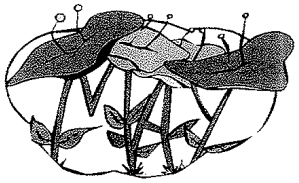
THE COMPANY WE KEEP:

People judge us by the company we keep, but more importantly we judge ourselves by the company we keep; not that we should be snobs about whom we make friends with. However, we should make sure that people we make friends with are sincere, scrupulous, and ethical.

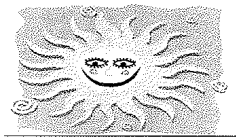
People attract relationships that reflect their mental and emotional states. Therefore, people with high self-worth attract well-adjusted people. People with low self-esteem often find themselves in failed relationships after failed relationships. If our friends and acquaintances are healthy people, it is a sign that we care enough about ourselves and meet our needs. If our companions aren't so healthy, we need to ask ourselves, why we are involved with them? Do we want to fix them? Do we think we are undeserving of peaceful, supportive relationships? Have we only been concerned with superficial characteristics--like looks or money--and not selected friends based on their values?

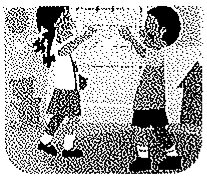
Today, let's evaluate our relationships and determine what they say about us. Look into your friends eyes. Do they mirror the self you want to see?

I measure the company I keep to determine my maturity.



May 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3 *Baltimore Zoo Trip*  *Imani Class* *Umoja Class* *Kuumba Class* *Ujima Class*	4	5
6	7  **Teacher**	8  **Appreciation**	9	10 **Week**	11 	12
13 *MOTHER'S DAY* 	14 GETTING READY FOR KINDERGARTEN TRANSITION - ALL WEEK 	15 *Nutrition Workshop 8:30am* 	16	17	18	19 *Male Involvement 3 ON 3 Basketball* 
20 *Volunteer Awards Ceremony 2:00-4:00pm* 	21	22 **Rehearsal Days - 22nd, 23rd & 24th For Graduates Only**	23	24 *FUN DAY* *For all children & Last day for non-graduates* *WIC (On site all day)*	25 *Closing Ceremony for graduates 10:00am-12:00pm (4 tickets per family)* **Boys-Khaki pants & White Shirts Girls—White Sundress**	26
27	28 *Memorial Day* *CENTER CLOSED* 	29	30	31	*Last day for Staff (June 1, 2012)* **Enjoy your summer!** 	



SEPTEMBER 2012
CONSCIOUS MINDS

From the Director's Chair

JAMBO PARENTS!!! I would like to welcome each and every one new and returning to St. Bernardine's Head Start...the center that believes, "AIN'T NO STOPPING US NOW." Parents, some of you are going to exhibit separation anxiety, IT IS OKAY!!! Parents are going to cry when leaving children for the first time, it is okay!! We will give your child back to you the way you gave them to us...I PROMISE!!! This is the beginning of a new phase for some of you while others are veterans at this. Each month you will receive a newsletter with tidbits of information that will hopefully help you in various ways.

Parents, we must formulate a policy committee. The policy committee is a very vital and important entity in the Head Start center. If a center elects not to have a committee, the center would be in jeopardy of CLOSING. Please assist us in this. It only requires a few hours a month (evenings) out of your day. It also will help you understand how Head Start functions overall.

Each Head Start is required to conduct a self-assessment on the program. St Bernardine's will conduct this assessment Dec 3-7, 2012. Parent participation, assistance, and training will be conducted several weeks before this happens. I will be contacting parents, along with FSC's, teachers, and Ed Coordinators to fulfill this requirement.

Many of you have probably heard by now, Baltimore City Head Start last year's lost the $27M grant which funded all the Head Start programs for the city. They have written to try to regain the grant. We do know that all Head Starts are guaranteed through June 30, 2013, after that, all bets are off. As we know more, we will keep you posted.

AHEAD OF TIME, I want to offer many thanks to the parents who ALLOW US TO DO THE JOB WE DO, AND FOR THE OTHERS WHO WILL SUFFER SEPARATION ANXIETY, AGAIN I SAY TO YOU, "IT IS OKAY, YOUR BABY WILL BE FINE!"

UPCOMING ELECTIONS FOR POLICY COMMITTEE REPRESENTATIVES WILL BE CONDUCTED IN THE VERY NEAR FUTURE. BE SURE TO PUT UP PICTURES AND ADVERTISE FOR THE POSITIONS YOU WISH TO TAKE ON. REMEMBER, LEGALLY, WE CANNOT HAVE A HEAD START CENTER WITHOUT A POLICY COMMITTEE. TWO PERSONS FROM THIS COMMITTEE ARE SELECTED TO REPRESENT US ON A CITYWIDE LEVEL. THEREFORE, PLEASE COME OUT AND VOTE FOR YOUR REPRESENTATIVES.

THOUGHT FOR THE MONTH

THE COMPANY WE KEEP:

People judge us by the company we keep, but more important we can judge ourselves by the company we keep. Not that we should be snobs about whom we make friends with. However, we should make sure that people we make friends with are sincere, scrupulous, and ethical.

People attract relationships that reflect their mental and emotional states. Therefore, people with high self-worth attract well-adjusted people. People with low self-esteem often find themselves in failed relationship after failed relationship. If our friends and acquaintances are healthy people, it is a sign that we care enough about ourselves and meet our needs. If our companions aren't so healthy, we need to ask ourselves why we are involved with them. Do we want to fix them? Do we think we are undeserving of peaceful, supportive relationships? Have we only been concerned with superficial characteristics--like looks or money--and not selected friends based on their values?

Today, let's evaluate our relationships and determine what they say about us. Look into your friends eyes. Do they mirror the self you want to see?

PEACE AND BLESSINGS.

EDUCATION CORNER

Greetings Parents /Guardians:

The Education team would like to welcome all families who are new and returning to St. Bernardine's Head Start Center. We are excited to have the privilege of working with your children this new school year 2012 - 2013. We have professional qualified teachers using the creative curriculum to promote school readiness. Our teachers are planning and ready to implement developmentally appropriate lesson plans, classroom activities while individualizing child development plans. We will all establish child development plans. We will all establish a nurturing, supportive, and stimulating relationship with you and your children through strong communication skills and an understanding of each child's stages of development. We hope to instill a love of learning that will last throughout your child's school year.

Submitted by:

Fun and Educational Kitchen Activities

Kids feel good about doing something "grown-up." Give them small jobs to do. Praise their efforts. Children are much less likely to reject foods that they helped make.

As our Head Start children grow, they are able to help out with different tasks in the kitchen. While the following suggestions are typical, children may develop these skills at different ages. Make sure that they wash their hands before helping! Enjoy cooking with your children, it is a bonding and fun learning activity!

At 2 years:

- Wipe Tables
- Hand items to adult to put away (such as after grocery shopping)
- Place things in trash
- Tear lettuce or greens
- Help "read" a cookbook by turning the pages
- Make "faces" out of pieces of fruits and vegetables
- Rinse vegetables or fruits
- Snap green beans

At 3 years:

All that a 2 year old can do, plus:

- Add ingredients
- Talk about cooking
- Scoop or mash potatoes
- Squeeze citrus fruits
- Stir pancake batter
- Knead and shape dough
- Name and count foods
- Help assemble a pizza

At 4 years:

All that a 3 year old can do, plus:

- Peel eggs and some fruits, such as oranges and bananas
- Set the table
- Crack eggs
- Help measure dry ingredients
- Help make sandwiches and tossed salads

At 5 years:

All that a 4 year old can do, plus:

- Measure liquids
- Cut soft fruits with a dull knife
- Use an egg beater

Results of a study conducted by Sean Logie, a Ph.D. student at the University of Maryland, Baltimore County.

Research has found the mood impacts the way that children think and behave when interacting with others. When children are angry, they often see anger and hostility in others, and their goals are often object-oriented instead of interpersonal. For example, when children are angry, they may focus more on obtaining objects that were taken away instead of finding out if their peers like them. Happier children may more accurately identify how others feel when looking at facial expressions. Happier children also may have goals that focus on relationships and finding solutions to problems. Most of this research has focused on older children and adolescents. There are very few studies that consider how mood may be related to how young children think and behave in social situations. This study had two goals. The first goal was to develop a computer game that elicits happiness and frustration in preschool children. If effective, this game may help researchers study mood in early childhood. This goal was partially achieved. Children reported feeling happier when they won the game and more frustrated when they lost to an opponent who lied. However, the children did not appear more frustrated when they lost or happy when they won. The second goal was to determine how mood affects the way that young children label facial expressions. This study found that when children reported feeling angry, they were more likely to see anger in pictures of children that appeared sadder. This study also found that when children reported feeling happy, they were more likely to see happiness in pictures of children that appeared sad or angry. Thank you to all parents, teachers, administers, staff, and children that made this study possible! If you have any questions or suggestions related to this study, feel free to contact Sean Logie at SLOGIE1@umbc.edu.

MORE CHIT CHAT!

September 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	*3* **LABOR DAY CENTER CLOSED**	*4* Staggered Enrollment	*5* Staggered Enrollment	*6* **SCHOOL BEGINS FOR ALL CHILDREN**	*7*	*8*
9	*10* **1st Time Home Buyer Education Workshop** **410-578-7190** **(Check your child's**	*11*	*12*	*13*	*14*	*15*
16	*17*	*18*	*19* **BACK TO SCHOOL NIGHT** **5:00-7:00PM**	*20*	*21* **IDENT-A-KID PROGRAM** **11:00AM**	*22*
23	*24*	*25*	*26*	*27* **MOBILE DENTIST** **9:00AM –2:30PM**	*28*	*29*
30						