

PIWI: THE EVIDENCE BASE

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Introduction

A primary goal of early prevention and intervention programs for infants and toddlers and their families is to support and enhance parenting capacity in ways that both optimize children's development and learning and also build parents' beliefs about themselves as competent in their parenting roles. When explicitly used as a basis for program practices, each program's theory of change guides the way it conceptualizes, organizes and provides its services, from its vision statement to the ways in which practitioners interact with parents day-to-day, as it seeks to accomplish this goal. When not explicitly used in this way, a program's theory of change may not make its way into practice, and intended outcomes may not be achieved (Hebbeler & Gerlach-Downie, 2002).

PIWI (Parents Interacting with Infants) is a relationship-based model of service delivery that combines developmental and family-centered perspectives into a relationship-based approach in which characteristics of parent-child interaction are both a focus and also a context for enhancing parents' understanding of their children's development. Through their own interactions and relationships with parents, PIWI practitioners recognize, respect, and enhance parents' capacity to fulfill a key role of parenting -- responding to and promoting their children's development and learning through parent-child interaction, while also experiencing and gaining competence and confidence as parents. PIWI's theory of change is that children's learning and development will be influenced through responsive parent-child interaction, which itself will be enhanced when parents are able to attend to, interpret and respond in particular ways to their children's current and emerging development and interactive signals. A further premise of PIWI's theory of change is that parents' ability to interpret their children's development and interactive abilities and signals will be strengthened by being able to place their own child's development into the larger framework of what is known about young children's development and learning in general. Further, parents' responsive interactions with their children will be enhanced when parent-child interactions are supported in ways that enhance their own views of themselves as competent parents.

The PIWI model of service delivery is based on three primary areas of research and theory. A rationale for each of these is described below; in the second section, each area is applied directly to different aspects of the PIWI model.

Parent-child interaction is the first area of research underlying the PIWI model relates to the characteristics of parent-child interaction that predict optimal development and learning (shared attention, warmth, sensitivity, contingent responding), and to interventions that consciously employ these characteristics to affect various aspects of development and learning in young children. Through their influence on gene expression, the qualities and characteristics of early interactions have been linked to brain development and to underlying abilities such as attentional capacities (Center on the Developing Child, 2016; National Scientific Council on the Developing Child, 2004; 2010). The relationship between parental responsiveness and a broad range of child outcomes is now well established. Further, interventions directed toward enhancing parent sensitivity and responsiveness not only bring about changes in parents' behaviors and perceptions but also related changes in their children's development and learning, both in general and in specific areas such as attachment, cognition, language, and social development (Dunst, 2007; Kong & Carta, 2013), for parents and children with a broad range of characteristics and developmental needs (Dunst, 2007). Nevertheless, although many infant-toddler programs value and believe they are implementing a focus on parent-child interaction, studies indicate

that their own interactions with the child predominate (McBride & Peterson, 1997; Peterson, Luze, Eshbaugh, Jeon, & Kantz, 2007). Further, a parents' awareness and accurate interpretation of a child's signals is prerequisite to positive, contingent responding, yet many parents have unrealistic beliefs about the abilities of infants and toddlers. Fortunately, they also want to know more about their child's development (Zero-to-Three, 2016), and this knowledge may be most powerful when linked directly to understanding their own child's abilities and signals within the context of the interaction (Felner, 1993). *In PIWI, characteristics of parent-child interactions provide an important avenue for enhancing parents' understanding of their child's behaviors and signals, within the context of building understanding of what and how all children develop and learn (McCollum, Gooler, Yates, & Appl, 2001). The primary role of the practitioner, irrespective of discipline or intervention setting (home visit or parent-child group) is to support and enhance interactions of the parent-child dyad, either as a direct focus or as a context for targeted child therapies.*

Family-centered principles and practices provide the second foundation for the PIWI model of service delivery, emphasizing how programs and practitioners provide their services and interact with families and family members in ways that positively influences their capacity as families and as parents (Trivette & Banerjee, 2015). Help-giving practices that are consistent with family-centered principles result in more positive outcomes for families; further, when parents develop positive, accurate perceptions about themselves as parents, they are more likely to engage their children in responsive interactions, such that more positive outcomes are also achieved by children (Dunst, 2007; Dunst, Trivette, & Hamby, 2007, 2008). A family-centered approach has been advocated across many types of service systems (e.g., health, education, social service), and is a core value in early prevention-intervention with parents and their young children. As noted above, however, specific family-centered, capacity-building practices often are not achieved as practitioners interact with parent-child dyads, even when a program values a family-centered approach (Salisbury, Cambray-Engstrom & Woods, 2012; Salisbury & Cushing 2013; Sawyer & Campbell, 2009; Schertz, Baker, Hurwitz & Benner, 2011). In PIWI, practitioners use specific help-giving practices to build parenting competence and confidence (McCollum, et al, 2001). While many different types of strategies (e.g., commenting, modeling, suggesting) are useful for building parenting skills within the context of the practitioners' interactions with the parent-child dyad, the practices must be used intentionally, in a way that simultaneously honors respects and scaffolds (McCollum & Yates, 1994), within the context of a cooperative practitioner-parent relationship (Popp & Wilcox, 2011).

Ecological systems theory is the third primary area of theory and research undergirding the PIWI model of service delivery (Bronfenbrenner, 1979). A systems perspective informs many different levels of PIWI. The parent-child dyad itself is viewed as a transactional system in which each member of the dyad influences the other, both at one point in time and across time (Sameroff & Fiese, 2000); understanding how characteristics of either parent or child may be influencing the interaction is critical to supporting it (Guralnick, 2001; Guralnick, Neville, Hammond & Conner, 2008). While PIWI was designed primarily to guide capacity-building interactions between practitioner and parent-child dyad within specific contexts (parent-child groups, home visits), this partnership was conceptualized as occurring within the context of a family system, itself influencing and influenced by the parent-child dyad, and all influenced by broader informal and formal support systems. Inter-professional and interpersonal relationships and interactions that take place within a program are critical to implementing services that are responsive to and supportive of the parent-child dyad, as are programmatic practices consistent with and supportive of the focus and process of a relational, strengths-based, family-centered approach. Ecological systems theory provides a unifying base across components of PIWI, any infant-toddler program of which it is a part, and other service programs with which it may interact. An important aspect of PIWI's theory of change is that relationships and program structures at all levels should model and support respectful relationships and capacity-building. However, without explicit attention, practices within and across program components may not be consistent with the program's theory of change, resulting in less cohesiveness between and among administrative and practitioner structures and practices

(Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). *Since PIWI's inception, principles drawn from research on parent-child interaction, family-centered practice, and ecological systems of services, as the foundations for PIWI's theory of change, have been intentionally integrated throughout all components of PIWI to ensure a consistent, cohesive system-wide perspective and practices (McCollum, et al., 2001; McCollum, Rowan, & Thorp, 1994). Questions that guided the development of PIWI practices were: "If this is what we believe and what the research says, what would we see going on? If I were observing, what could I expect to see happening?" The answers to these questions became PIWI guidelines and practices and a basis for ensuring ongoing fidelity to the model, and are asked again and again as programs replicate PIWI and reflect on their practice.*

PIWI makes sense for many kinds of programs for infants and toddlers and their families, whether the particular program defines itself as prevention, promotion, or intervention; or as health, social service, or education. Parent-child interaction provides the "what," and family-centered and system practices provide the "how." The most successful of the programs that have sought to replicate the PIWI model of service delivery are those that embraced the values underlying PIWI and used PIWI guidelines to establish a respectful focus on parent-child interaction and to re-examine practices throughout their programs, in order to achieve consistency with PIWI's theory of change.

As a model of service delivery, PIWI is highly consistent with evidence-based practices of the Division for Early Childhood (2014, 2015). PIWI also has strong face validity, directly established through expert opinion (McCollum, Gooler & Yates, 1999) and through extensive interviews and observations in programs that have replicated the PIWI model of service delivery in different kinds of settings (Cole, McCollum, Swinford, Dewar, & Hughes, 2009; McCollum & Yates, 2004; McCollum, Yates, Laumann & Hsieh, 2006). Finally, PIWI's "bottom lines" have a solid grounding in three specific areas of research, introduced above and outlined further below.

While a program may benefit from using only some PIWI practices, it is NOT using a PIWI model of service delivery with fidelity unless it is based on the full range of PIWI guidelines and practices representing each of these three areas of research.

Translating Research and Theory to PIWI Practices

In the sections that follow, the term "family" refers to two or more people who define themselves as family and perform important family functions such as parenting (Trivette & Banerjee, 2015), whereas "parent" refers to any primary caregiver with whom the child may form a primary, long-term attachment relationship (McCollum, Gooler, & Yates, 1999). "Practitioner" refers to any individual who works with children and their families to enhance their optimal development, including care, education or therapy for the child, and support to the child's family (Division for Early Childhood, 2014). The term "intervention" refers to any type of program activity that is intentionally planned and implemented to optimize, strengthen, enhance, promote, or change the trajectory of functioning or development of its recipients. Selected research syntheses and reviews of studies, where available, are used as references; we are grateful for the work of Dunst and his colleagues, which has provided many relevant syntheses and reviews. A more extensive but not exhaustive list of additional supporting material for different aspects of the PIWI model can be found in the References. The *PIWI Philosophy* and *PIWI Implementation Guidelines*, which were the foundation for developing specific PIWI practices, are attached in the Appendix, as are examples of other supporting PIWI materials.

Parent-Child Interaction

A. Parent-child interactions and early development and learning

- Early interactions with parents and other primary caregivers set the stage for all areas of current and emerging development and learning and lay the foundation for the future (Center on the Developing Child, 2016; National Scientific Council on the Developing Child, 2004; 2010).
- Parent sensitivity and responsiveness (ability to attend to and respond contingently to the child's emotional, cognitive, motivational, and communicative signals) play a central role in determining what the child experiences during parent-child interactions, including children who are typically developing and those who have or are at risk for developmental delays or disabilities (Center on the Developing Child, 2016; Spiker, Boyce, & Boyce, 2001; Trivette, 2007).
- The ability to attend to and interpret the other's signals is dependent on what each partner brings to the interaction at each point in time, across time in a single interaction, and over time as each partner develops and changes (Sameroff & Fiese, 2000); any factor that interferes with the clarity or predictability of signals in either parent or child, or with the ability to attend to and interpret the other's signals, place the dyad at risk for less pleasurable and/or less developmentally-supportive interactions (Guralnick, 2001; Guralnick et al., 2008; Sameroff & Fiese, 2000).

What PIWI Does
<ul style="list-style-type: none"> • Parents are the primary interactors with their children during PIWI sessions, respecting parents' relationship and roles with their children and their importance in their children's development and learning • PIWI sessions provide multiple opportunities for pleasurable parent-child interaction that is engaging for both members of the dyad in typical parent-child interaction contexts • PIWI supports and enhances mutual enjoyment with parent-child dyads by providing and acting on multiple opportunities to recognize and enhance competence and confidence in both parent and child • Developmentally-matched environments, activities, and discussions focus on parent's attention to, interpretation of, and response to their child's interests, abilities and communicative signals as they interact with their children

B. Parent-Child Interactions as Focus and Context for Prevention-Intervention

- Interventions that focus on the parent's sensitivity and responsiveness during parent-child interaction (variously called responsive interaction, responsive parenting, responsive teaching, relationship focused, and others) have resulted in more responsive parent behavior in dyads with a variety of risk factors and disabilities (Dunst & Kassow, 2007, 2008; Dunst, Trivette, & Hamby, 2006, 2007; Kong & Carta, 2013).
- Changes in parental sensitivity and responsiveness as a result of responsive interaction intervention bring about changes in a variety of developmental and learning outcomes in children, including those with a range of risk factors and disabilities (Dunst, Trivette, & Hamby, 2006, 2007; Kong & Carta, 2013)
- While critical characteristics of responsive interaction are constant across ages, children's emerging abilities and interests change with development (e.g., emotional expression, actions with objects, language, social behavior with peers) as do typical environments in which interactions occur (Kochanska & Askan, 2004); both appropriate contexts and the specific parent behaviors emphasized by responsive interaction intervention also change with development (Landry, Smith, Swank & Guttentag, 2008).
- When children have specific, targeted needs such as those associated with disabilities or developmental delays, responsive interaction interventions have been effective in teaching parents specific ways to match and respond to their children to support development of specific skills (such as requesting or labeling objects in children with language delay) as well as more general developmental abilities (such as joint attention or engagement) in children with a range of characteristics and needs (Dunst & Kassow, 2008; Kong & Carta, 2013; Raab, Dunst, & Hamby, 2006)
- Opportunities for development and learning through responsive interaction intervention are greatly increased when intervention occurs within everyday contexts in which children learn and develop and in which parents and children typically interact (Dunst, Bruder, Trivette & Hamby, 2006), including parent-child play, book-reading, caregiving routines, and family outings.
- The most effective responsive interaction interventions for influencing parental sensitivity and responsiveness within the context of parent-child interaction are short-term and focus specifically on parent behaviors associated with awareness, interpretation, and contingent responsiveness to their children's behavior and interests, as compared to providing only social support or to providing general knowledge of development and parenting (Dunst & Kassow, 2007; 2008).

What PIWI Does
<ul style="list-style-type: none"> • PIWI session environments match, simulate, and support parent-child interactions in everyday home and community-based activities • Each PIWI session is organized around a specific developmental topic appropriate to the abilities and interests of the children for whom it will be used, with the environment

- The environment for each PIWI session is planned to support parents' observing, interpreting, and responding to specific aspects of the children's behavior
- General knowledge of children's development and the conditions and interactions that support it are provided within the context of supporting parental observations and understanding of their own children's current and emerging abilities, interests, and ways of communicating
- Sensitivity and responsiveness are intentionally modeled when appropriate during practitioner-dyad and practitioner-child interactions, and recognized and promoted during parent-child interactions using specific interaction strategies
- Targeted, individual goals and associated intervention practices, as well as accommodations and adaptations for individual children with specific needs, are integrated within PIWI environments and parent-child activities that are designed to promote parental sensitivity and responsiveness, based on the parents' priorities
- Each PIWI group session includes typical parent-child environments and activities (such as parent-child object play, book-reading, singing) and discussion of carry-over to home is part of group discussion; PIWI home visits emphasize similar activities in the home
- A team structure is used as a basis for decision-making and peer support across practitioners and disciplines, in order to maintain a focus on a broad, integrated perspective on children's development and learning; in PIWI group sessions, practitioners share all roles while providing disciplinary expertise to others on the team

Family-Centered Help-Giving: What the Research Says

- Family-centered help-giving practices (demonstrating high regard and respect for families' strengths and abilities; promoting new knowledge and abilities; establishing collaborative partnerships with families) are related to a variety of positive parent and child outcomes (Dunst, Trivette, & Hamby, 2007, 2008; Trivette & Banerjee, 2015; Trivette, Dunst & Hamby, 2010).
- Children's development and learning are most likely to be positively related to parents' understanding of child development and learning when parents also have realistic perceptions of their own parenting abilities, whereas high self-efficacy is negatively related to children's outcomes when parents have less or unrealistic knowledge of child development; child development knowledge and realistic self-efficacy together predict positive child outcomes (Hess, Teti & Hussey-Gardner, 2004).
- Building capacity by providing new knowledge and skills has direct effects on parental self-efficacy and well-being and has both direct and indirect effects on parents' ability to provide development-enhancing learning opportunities for their children (Dunst & Trivette, 2009; Trivette, Dunst & Hamby, 2010), in children and families with a variety of different characteristics and across different developmental and learning areas in children.
- Capacity-building in parent-child interaction is most effective in achieving parent and child outcomes when parents perceive it as relevant to daily activities and settings in which parent-child interactions occur (Dunst, Bruder, Trivette & Hamby, 2006)
- Families experience services as helpful when services are integrated and consistent across the practitioners with whom the family interacts and when collaborative relationships are consistent across all levels (Espe-Sherwindt, 2008; Guralnick, 2001).

What PIWI Does

- A central purpose of PIWI is to support and enhance parents' self-efficacy and well-being as parents
- Respect for family strengths and choices and opportunities to establish collaborative partnerships with parents are built into initial and ongoing contacts with families
- Capacity building provides the foundation for each PIWI session, including understanding own child's development and own role in supporting it

- Enhancing parents' knowledge of children's development is provided within the context of interpreting one's own child's behavior and signals during parent-child interaction, supported by targeted environments and brief discussion of more general information on development
- Capacity-building provides a consistent, coherent practice foundation for all relationships (parent-child, practitioner-parent, practitioner-child, practitioner-practitioner, supervisor-practitioner); practitioners model respectful, strengths-based relationships with parents and children as well as among themselves as they plan and implement PIWI home visits or group sessions
- Knowledge of their children's development is based on parent's awareness and observations of their children's behavior within environments and activities planned to enhance sensitivity to each child's current and emerging interests and abilities
- Practitioners use specific triadic strategies as they interact with each parent-child dyad to honor and build on strengths and to scaffold new developmental knowledge and responsive interactions in the parent-child dyad
- In parent-child group sessions, roles are shared across practitioners-disciplines according to a specific, rotating roles plan; each practitioner serves as group leader and interacts with each parent-child dyad during the session, while also bringing their own unique expertise to planning and implementing the group session
- Practitioners share disciplinary and personal expertise in planning individualized home visits, so that each brings a comprehensive knowledge of goals and strategies from all team members to each home visit
- Administrators and practitioners initiate and advocate for shared communication and integration of services when children and parents participate in more than one service program.

Ecological Systems and Systems of Service

- An articulated theory of change in which program guidelines and practices are consistent with intended outcomes supports cohesiveness and consistent practices within and across program components (Fixsen, Blase, Naoom, & Wallace, 2009; Hebbeler & Gerlach-Downie, 2002)
- Parent-child interactions take place within parent-child, family and community systems that influence and are influenced by the characteristics of those interactions at each point in development and time; early childhood programs that meet family priorities for formal and informal supports and services positively influence how and when parents interact with their children as well as the quality of those interactions (Bronfenbrenner, 1979; Dunst, 2007)
- Fidelity to a program's theory of change is achieved when administrators and practitioners are selected, trained, coached, and supervised to value and implement specific associated program practices at all levels of the program, and use continuous feedback for program improvement (Bertram, Blase, & Fixsen, 2015)

What PIWI Does
<ul style="list-style-type: none"> • The PIWI Philosophy and associated PIWI Practice Implementation Guidelines provide a cohesive, theory-based structure for making practice decisions across all aspects of program planning and implementation, based on an articulated, evidence-based theory of change • The team of PIWI practitioners reflects on each PIWI session from the perspectives of what each child and parent experienced, as well as their own team process, from the perspective of the PIWI Implementation Guidelines • PIWI Philosophy and Practice Implementation Guidelines are used as a foundation for personnel hiring, training, ongoing team reflection and peer coaching, and for ongoing personnel development by administrators and other trainers with deep understanding of the PIWI model of service delivery • PIWI Philosophy and Practice Implementation Guidelines guide ongoing program improvement, based on measured fidelity to PIWI guidelines , to ensure ongoing adherence to the PIWI model

"Doing PIWI:" Bottom Lines

PIWI (Parents Interacting with Infants) is a model of service delivery for early prevention-intervention, birth-3, in parent-child groups and home visits. It was first developed as a parent-child group to support the preparation of university students from across several disciplines (e.g., early childhood education, special education, speech/language pathology, social work, human development) (McCollum, Rowan, & Thorp, 1994; McCollum, Gooler, Yates & Appl, 2001), supplemented with guidelines and examples for implementing specific PIWI components (McCollum & Yates, 1994; McCollum, Yates, Gooler & Bruns, 2001). Since then, PIWI has been used by early programs serving parent-child dyads with a variety of different characteristics (e.g., children with various disabilities as well as those who are typically developing; children who are at risk because of family demographics, parental stress or mental health) (McCollum, Yates, Laumann & Hsieh, 2006; Cole, McCollum, Swinford, Dewar & Hughes, 2009). Many of the parent-child groups have been inclusive, with children and parents representing a range of characteristics, whereas others have focused on specific populations (e.g., hearing impairment, at risk for abuse). PIWI also has been used as a foundation to plan and implement home visits, either in conjunction with the parent-child groups or as a separate program component.

For many programs, PIWI has offered a way to engage in program improvement efforts that are in line with their own values and theory of change (e.g., Cole et al, 2009). Most infant-toddler programs provide a broad range of services that go beyond parent-child groups or home visits, depending on the characteristics of the children and families they serve; for these programs, PIWI offers a way to build cohesion that reflects the program's values.

When programs fully implement PIWI, they are implementing practices related to each of three specific evidence-based program components: parent-child interaction; family-centered practice, and service systems. Fidelity to the PIWI model of service delivery is based on a consistent theory of change that crosses program components, and must be demonstrated for each component both initially and then on an ongoing basis (Fixsen et al., 2009) as programs achieve and then maintain coherence to the model and across components. Only then can a program be said to be "doing PIWI."

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